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California State University
San Bernardino

EMERGENCY MEDICAL SERVICE TRAINING
FOR CALIFORNIA PEACE OFFICERS

A Project Submitted to
The Faculty of the School of Education

In Partial Fulfillment of the Requirements for the
Degree of

Master of Arts
in

Education: Vocational Option

By

Chris Rolland Coplen, B.V.E., M.A.

San Bernardino, California

December 1989

Emergency Medical Service Training
For California Peace Officers

By

Chris Rolland Coplen, B.V.E., M.A.

June 1989

Approved by:

A black rectangular box redacting a signature.

Advisor: Dr. Andrew E. Schultz

A black rectangular box redacting a signature.

Second Reader : Dr. Ronald K. Pendleton

DEDICATION

To my loving family, for without your love and continued support this mile stone in my life could never have been achieved.

My Heartfelt Thanks

ACKNOWLEDGMENTS

I would like to first thank Professor Andrew E. Schultz, Ph. D. for his valuable guidance. As my advisor he has played an active role in both my research, the expansion of my knowledge, and my overall education. He has been a true friend and mentor during my trek to achieve the Masters Degree; for this, I am deeply grateful and appreciative.

Special thanks to Professor Ronald K. Pendleton, Ph. D. his guidance in the early years of my formal education has proven to be invaluable to me. His many enlightening conversations are appreciated far more than he will perhaps ever know.

Finally to my fellow students in Education 637, 638, 639. For without your support, collaboration, understanding, humor, and camaraderie the attainment of this Masters Degree would have been greatly diminished.

ABSTRACT OF THE THESIS

Emergency Medical Service Training
For California Peace Officers

By

Chris Rolland Coplen
Master of Arts in Education

California State University
San Bernardino, 1988

Statement of the Problem

The purpose of this curriculum is to fill a void created by the passing of California Penal Code Section 13518 in the medical service training of California Peace Officers. Until the passage of this legislation no clear cut definitive program existed to train California Peace Officers in emergency medical services.

Existing curricular materials were not suited for the kinds of care peace officers must provide under the new legislation. The existing materials were better geared to the emergency medical technician or paramedic and not the front line peace officer.

The peace officer must be able to sustain the victim for the first critical minutes until advanced life support personnel can arrive on the scene of an accident or catastrophic situation. To that end this training curriculum is offered in hopes that untold numbers of lives may be saved by its implementation.

Description of the Project

The project looked at the existing literature in the field of First Aid and Cardiopulmonary Resuscitation. The author of this project completed an exhaustive review of the literature and found that nothing currently existed that address the guidelines of the new legislation. After the review was complete the author began to develop a specific training curriculum that would meet the requirements of the new legislation. To that end the project was developed and the new curriculum was presented. A test of the curriculum was conducted using recruit peace officers in training at the Riverside County Sheriff's Academy to ensure that the curriculum was in fact plausible to include in a basic training format. The proposed curriculum passed the scrutiny of the academy staff and student officers with flying colors. After the curriculum was validated it was completed and presented for the approval of the School of Education.

TABLE OF CONTENTS

Title Page	i
Signature Page	ii
Dedication	iii
Acknowledgments	iv
Abstract of Thesis	v
Table of Contents	vii
Chapter One	
Introduction	1
The Objective	1
Context of the Problem	1
Problem Statement	4
Purpose of the Project	4
Definitions	4
Delimitations	5
Limitations	5
Summary	5
Review of the Literature	7

Methodology	15
Calendar of Events	19
Cost and Budget	20
Chapter Two	
Training Curriculum	21
Rational of the Curriculum	21
Goals of the Curriculum	23
Section One - Introduction to First Aid	
Learning Goal	24
Performance Objective	24
Resource Material	24
Definition	24
Evaluation of Victim	25
Value of First Aid Training	30
General Considerations and Direction	30
Section Two - Shock	
Learning Goal	31
Performance Objective	31
Resource Material	31
Definition	31

Causes	32
Signs and Symptoms	32
Treatment Objectives	34
First Aid Measures	34

Section Three - Respiratory Emergencies

Learning Goal	37
Performance Objective	37
Resource Materials	37
Definitions	37
Causes of Respiratory Failure	38

Section Four - Obstructed Airway

Learning Goal	42
Performance Objective	42
Resource Material	42
Recognition of Foreign Obstruction	42
Management of the Obstructed Airway	44
Manual Thrusts	44
Devices	48
Abdominal Thrusts / Chest Thrusts	52
Unconscious Victim	53

Section Five - Wounds

Learning Goal	54
Performance Objective	54
Resource Material	55
Definition	55
Common Causes	55
Symptoms	56
First Aid for Open Wounds	58
First Aid for Severe Bleeding	58
Prevention of Contamination and Infection	64
Bites	69
Closed Wounds	71

Section Six - Poisoning

Learning Goal	74
Performance Objective	74
Resource Material	74
Definition	74
Causes	74
Signs and Symptoms	75
Treating Poisoning by Mouth	76

First Aid	76
Contact Poisons	82
Prevention	84
Poisoning by Marine Life	84
Poisonous Insect Bites	84
Poisonous Snakebites	88
Prevention of Accidental Poisonings	95

Section Seven - Specific Injuries

Learning Goal	96
Performance Objective	96
Resource Material	96
Eye Injuries	96
Head Injuries	100
Neck Injuries	108
Wounds of the Chest	109
Abdominal Injuries	112
Back Injuries	112
Injuries to the Genital Organs	114
Injuries to the Legs and Feet	115
Hand Injuries	116

First Aid for Blisters116
----------------------------------	------

Section Eight - Drugs

Learning Goal . . . . .	.118
Performance Objective . . . . .	.118
Resource Material . . . . .	.119
Definitions . . . . .	.119
Classification of Drugs . . . . .	.121

Section Nine - Burns

Learning Goals . . . . .	.144
Performance Objectives . . . . .	.144
Resource Material . . . . .	.145
Definition . . . . .	.145
Causes and Effects . . . . .	.145
Classification . . . . .	.146
Extent and Location . . . . .	.148
First Aid . . . . .	.148
Prevention of Heat Emergencies . . . . .	.154

Section Ten - Frostbite and Cold Exposure

Learning Goal . . . . .	.163
Performance Objective . . . . .	.163

Resource Material . . . . .	.163
Frostbite . . . . .	.163
Cold Exposure . . . . .	.167

Section Eleven - Ill Effects of Heat

Learning Goal . . . . .	.170
Performance Objective . . . . .	.170
Resource Material . . . . .	.170
Definitions . . . . .	.170
Causes . . . . .	.171
Heat Stroke . . . . .	.171
Heat Cramps . . . . .	.172
Heat Exhaustion . . . . .	.173

Section Twelve - Sudden Illness

Learning Goal . . . . .	.175
Performance Objective . . . . .	.175
Resource Material . . . . .	.175
Heart Attack . . . . .	.176
Stroke . . . . .	.178
Fainting . . . . .	.180
Convulsions . . . . .	.181

Epilepsy	183
--------------------	-----

Prevention of Heart Attack and Apoplexy	184
---	-----

Section Thirteen - Dressings and Bandages

Learning Goal	186
-------------------------	-----

Performance Objective	186
---------------------------------	-----

Resource Material	186
-----------------------------	-----

Dressing	185
--------------------	-----

Bandages	188
--------------------	-----

Combination Dressings and Bandages	189
--	-----

Special Pads	190
------------------------	-----

Applications of Bandages	190
------------------------------------	-----

First Aid Kits and Supplies	198
---------------------------------------	-----

Section Fourteen - Bone and Joint Injuries

Learning Goals	202
--------------------------	-----

Performance Objectives	202
----------------------------------	-----

Resources Material	203
------------------------------	-----

Definitions	203
-----------------------	-----

Fractures	204
---------------------	-----

Specific Fractures	211
------------------------------	-----

Dislocation	219
-----------------------	-----

Sprains . . . . .	.221
Strains . . . . .	.222
Prevention of Skeletal and Muscular Injuries . . .	.222

Section Fifteen - Emergency Rescue and Transfer

Learning Goal . . . . .	.232
Performance Objective . . . . .	.232
Resource Material . . . . .	.232
Definition . . . . .	.233
Indications for Immediate Rescue . . . . .	.234
Procedure . . . . .	.234
Methods of Transfer . . . . .	.236

Section Sixteen - Emergency Childbirth

Learning Goals . . . . .	.251
Performance Objective . . . . .	.251
Resource Material . . . . .	.252
Signs and Symptoms of Impending Childbirth . . .	.253
Delivery Procedures . . . . .	.254
Care After Delivery . . . . .	.259
Supplies for Emergency Childbirth . . . . .	.260

Section Seventeen - Vehicle Extrication

Learning Goals . . . . .	.261
Performance Objectives . . . . .	.261
Resources Material . . . . .	.262
Removing Trapped Victims from Vehicles . . . .	.263
Victims Who Have Become Entangled . . . . .	.265
Motor Vehicle Accidents . . . . .	.265
Catastrophic Accidents . . . . .	.265

Section Eighteen - Cardiopulmonary Resuscitation

Learning Goal . . . . .	.270
Performance Objectives . . . . .	.270
Resource Material . . . . .	.271
Cardiac Arrest Victim . . . . .	.271
Rescue Breathing . . . . .	.276
One Rescuer C.P.R. . . . .	.286
Two Rescuer C.P.R. . . . .	.288
Basic Life Support for Infants and Children . . . .	.292

Section Nineteen - Legal Aspects of First Aid and C.P.R.

Learning Goal . . . . .	.308
Performance Objectives . . . . .	.308

Resource Material . . . . .	.308
Definitions . . . . .	.308
Laws that Help the Provider . . . . .	.310
Legal Aspects . . . . .	.310
Emergency C. P. R. Immunity . . . . .	.314
Bibliography . . . . .	.316
Appendix A Testing Questions . . . . .	.318
Appendix B Testing Scenarios . . . . .	.360

EMERGENCY MEDICAL TRAINING

FOR

CALIFORNIA PEACE OFFICERS

INTRODUCTION

Statement of the Objective

The Objective

The objective of this project was to develop a curriculum in Emergency Medical Service Training for California Peace Officers. The curriculum adhered to the guidelines as prescribed by the California Commission on Peace Officers Standards and Training in conjunction with the guidelines established by the California State Department of Public Health.

Context of the Problem

In 1987, members of the California State Legislature passed a bill that amended the California Penal Code section 13518. The bill was supported by the California Peace Officers Association as well as the Association of Chiefs and County Sheriff's. The law was enacted to provide for the training of California Peace Officers in emergency first aid, cardiopulmonary resuscitation, vehicle extrication, and emergency child birth.

The new law did not however, provide for the development of the curriculum for this new training. Representatives of the two major agencies that supported the legislation then asked for assistance.

The California Commission on Peace Officer Standards and Training (POST) was called upon for its expertise in peace officer training, as was the California State Department of Public Health for its expertise in the education and training of the medical community. These two agencies were given the responsibility for the development of the EMS training curriculum (Clark, 1987).

The two agencies formed a blue ribbon panel of experts from around the state in the field of law enforcement training and public health education to study the problem of curriculum development. As a member of the blue ribbon panel, the author was involved in the curriculum development process. There were several courses previously taught that met the requirements of the old law but nothing had been established to meet the needs of the new legislation. Several agencies and community colleges had classes that were being taught to meet the hourly requirements (Clark, 1986).

The content of these classes, however was not clearly defined and consequently did not meet the law. For example, the number of training hours varied greatly. According to the research done by POST some training institutions were giving their officers as little as eight to ten hours of training while other agencies were giving as much as one hundred and sixty hours of medical training to their personnel (Clark, 1987).

In the first few meetings held by the blue ribbon panel the question of who would provide the training arose. Another commonly asked question was why emergency medical technicians or medical doctors could not provide the training to the peace officers. The POST commission was not in favor of outside trainers due again to the cost factor. The agency could select an employee to be trained as an instructor by the State of California and save money over having to pay an outside expert to conduct the required training at their institution. Additional concerns were raised during the preliminary stages of planning.

The POST commission conducted a survey of the various user agencies. The decision was made that the individual agencies would absorb the cost of the

overtime into their training budgets. Questions as to the length of certification soon arose. The panel of experts decided that the individuals who were working on the curriculum would also decide the length of the certification for the curriculum, and how the retraining would be accomplished (Bray, 1987).

One of the last questions to be addressed was, did the law enforcement profession indeed need the proposed new training. The POST commission cited several studies that addressed the question of a peace officers need for first aid training they had conducted in 1970, 1975, 1980, and 1985. The studies showed that field officers all felt their level of first aid training was not adequate.

The California Department of Transportation cited several of its studies in which evidence was shown that if an injured victim of a traffic accident was given first aid within the first five to ten minutes they stood a better chance of surviving. The study went on to say that a victim who was not treated for twenty minutes or longer stood a lesser chance of survival.

An additional study cited by the Department of Transportation was one compiled during the Vietnam war by the U.S. Army. It showed that a soldier wounded in combat was more likely to receive aid faster than a civilian injured on any major freeway in the United States.

Studies from several state agencies have indicated that a revised curriculum was needed. It was the task of the blue ribbon panel of experts to develop a viable and topical curriculum.

After the initial meetings of the two agencies the POST Commission established a schedule that set a time table for the development of the training curriculum. The

panel of experts agreed to adjourn and work separately on the EMS training curriculum.

Problem Statement

The problem was that with the passage into law of section 13518 of the California Penal Code, no training curriculum was in place that addressed all the needs expressed by the new law as it dealt with the Emergency Medical Service Training for California Peace Officers.

Purpose of the Project

The purpose of the project, therefore, was to develop a curriculum in Emergency Medical Service Training for California Peace Officers. This training curriculum has adhered to the guidelines as prescribed by the California Commission on Peace Officers Standards and Training in conjunction with the guidelines established by the California State Department of Health.

Definitions

POST:

The abbreviation given to the California Commission on Peace Officer Standards and Training. A training agency established by the State of California.

EMST:

The abbreviation given to the Emergency Medical Services Training curriculum that will be the topic of this project.

P.C.:

The abbreviation given for the California Penal Code.

Delimitations

1. The project has dealt only with the EMST given to California Peace Officers as defined by the California State Penal Code sections 830-830.6.
2. The project has addressed only those training areas as defined in section 13518 of the California Penal Code.

Limitations

This project is limited by time and money. The resources allocated for its completion are only available until December, 1989. Medical science will undoubtedly discover more successful methods than those espoused herein.

Summary

The introduction segment of the project, Emergency Medical Service Training for California Peace Officers, has identified the problem to be addressed and has briefly argued why the project is needed.

Organization of the Remainder of the Project

The remainder of the project includes, a comprehensive review of the literature as it pertains to the topic, a section on the methodological innovations used in the process of completing this project, and finally a summary section. A comprehensive bibliography follows and a complete appendix as needed has been provided.

REVIEW OF THE LITERATURE

Introduction

The review of the literature for Emergency Medical Service Training of California Peace Officers has taken the following format; first, a historic review of the emergency medical training traditionally given to California Peace Officers. A review of the new legislation, section 13518 of the penal code, enacted in 1987 which was the impetus for this training curriculum. Then a complete search of the available literature dealing with the area of peace officer training in first aid took place. The literature ranged from the most basic texts to complex medical journals and research studies.

The Early First Aid Training

As early as 1902 the American National Red Cross was providing training to the general public in first aid and other life saving techniques. The early text books were not very scholarly and were commonly found to be difficult to read.

The information contained in the early Red Cross books was so unscientific, compared to current teaching, that in some cases the treatment would not have aided in the victims recovery. For example the 1933 first aid book, for basic first aid, listed the use of a tourniquet as one of the first steps in the control of serious bleeding. Today it has been proven that the use of a tourniquet is quite dangerous at best and if used great care must be taken to ensure that the victim does not suffer permanent injury or disability by its use (Dunlap, 1971).

No other agency of the time was publishing first aid training materials. The Red Cross, logically became the agency charged with the job of training the American people all about first aid and artificial resuscitation.

Many early first aid books also stressed the use of ice for treatment of certain injuries to the bones and joints. This treatment has also been shown to cause additional injury to the victim by current standards. Some early first aid books also stated it was a good idea to have an accident victim move their limbs to see if they were in fact injured. This technique is no longer presented as a sound treatment for bone or joint injuries.

Probably the single biggest change in the first aid literature came in the area of artificial resuscitation. For literally twenty five to thirty years the use of the back pressure arm lift method of artificial resuscitation as well as rolling the victim over a barrel was used to revive the victim. The use of mouth to mouth or mouth to nose resuscitation did not become wide spread in its use until the early nineteen sixties.

In early text books used by the Red Cross certain special emergencies were not even discussed. Among them were what to do for victims of snake bite, or how to handle the victim of an epileptic seizures, or the proper method of treating someone who is suffering from a diabetic related emergency. None of these common emergencies were even mentioned and thus many victims probably died due to the lack of treatment.

The New Legislation

Section 13518 of the California Penal Code was passed in 1987 by the state legislature. It provided for the training of California Peace Officers in First Aid, Cardiopulmonary Resuscitation, and other emergency procedures.

The text of the law is as follows:

- (a) Every city police officer, sheriff, deputy sheriff, marshal, deputy marshal, peace officer member of the California State Police, peace officer of the California Highway Patrol.
- (b) Peace officers of a district authorized by statute to maintain a police department, except those whose duties are primarily clerical or administrative, shall meet the training standards prescribed by the emergency Medical Service Authority for the administration of first aid and cardiopulmonary resuscitation. In addition, satisfactory completion of periodic refresher training or appropriate testing in cardiopulmonary resuscitation and other first aid as prescribed by the Emergency Medical Services Authority shall also be required (California State Legislature, 1987).

Clearly the new law does not establish a training curriculum for California Peace Officers. Consequently, given the legislative mandate, the need for this project is equally clear.

Training Begins to Improve

During World War II training for the general public began to change. The medical technology derived from battle field conditions was an effective school for the immediate care of the injured and wounded. Given this experience, members of the American Red Cross took a critical look at the type of training it was providing to the general public.

As a result of the nineteen forty six convention of the American National Red Cross the training of first aid to the general public took a dramatic step forward. With the help of the United States Army the American Red Cross took the breakthroughs made on the battle field and incorporated them into their first aid programs. Until then the basic training given to peace officers in first aid was the same as that given to the general public. It soon became clear that a more advanced form of first aid was needed for para medical personnel like peace officers, firemen, and ambulance drivers and attendants. To meet this need the Red Cross developed a tiered system of training to help address this growing problem (American Red Cross, 1979).

In 1952 the Red Cross came out with three basic types of first aid training. The first was called Basic First Aid and was intended for the general public. The second was called Standard First Aid and was intended for the person who wanted a greater knowledge of first aid. The third was called Advanced First Aid and was projected for the para medical personnel that required the training for their jobs, or the individual who just wanted to expand their knowledge of first aid. The length of training ranges from a eight hour class for Basic First Aid to forty hours for the Advanced First Aid (Tills, 1952).

As time passed the need for public first aid classes grew. One of the biggest reasons for this need was the faster modes of transportation and a changing attitude toward the basic and traditional values of violence toward ones fellow man. More and more victims were being seen and the need for faster and more effective first aid measures was apparent (Dunlap, 1971).

The need for a more in depth training curriculum was apparent. Until this time there has been very little literature in the field of first aid to review. Now that more institutions and agencies are involved the amount of literature has increased (Ellison, 1984).

There have been literally dozens of books written on various topics of first aid. Most are very specific and give the layman much more information than would be needed to cope with any daily emergency. Some of these books are very specific to the type of activity the person is taking part in. There have been books written for outdoorsmen, campers, hikers, and backpackers. While the information contained in this book is valid there is some question as to the need for a specific book covering these activities. Most medical experts feel that if every one took a Standard First Aid class it would prepare them for the majority of emergencies that would likely be encountered at home, on the road, during standard recreational activities, or in disaster situations (Huff, 1972).

For those individuals that become involved in a specific vocation, dangerous or special type of sport or recreational activity additional training should be taken. Thus lowering the chances of them becoming an injury statistic by being prepared for possible dangerous situations.

In addition to the specific nature of some of the books and articles the validity of these books and articles must be inspected. For example, the author in reviewing books and articles for this project found many of them were outdated in the information they presented. In the 1975 copy of the American Red Cross first aid book the use of ice as a treatment for bone and joint injuries was recommended.

Today, the use of ice as a treatment for bone injuries is no longer suggested by the American College of Orthopedic Surgeons.

Now if a person was to read in a text that ice was good to use and then used this treatment on the victim of a dislocated fracture the resulting injury to the victim could cause permanent damage. For this reason alone it is highly recommended for providers of any type of first aid treatment be kept abreast of any and all new advances in the field.

Additional review by the author found that there are now many films and video tapes that cover some of the topics dealt with in the various first aid programs available. This type of media is recommended because it uses more of the student's senses to learn. There is however, the same danger of the material in the film or video becoming outdated. It is therefore, the job of the instructor to ensure that all forms of instructional material used in their class be current and up-to-date in every detail.

The growing classes of medical providers

As the various classes of medical providers began to increase during the early seventies the numbers and types of training classes also had to change. As of January 1988 there were approximately seven classes of emergency provider of pre-hospital care or field personnel. This does not include the basic peace officer or fireman not assigned to a emergency rescue squad or special accident investigation team.

Each of the seven classes of pre-hospital care providers have their own specific course requirements and guidelines that have been established by the Emergency Medical Services Authority of the State of California. Of these seven pre-hospital

care providers all of them fall into the basic category of field ambulance personnel. The differing grades are defined by the level of training and the type of advanced procedure they are allowed to perform in the field.

For example, the Emergency Medical Technician I can only do those procedures approved by their specific training curriculum. Among these procedures might be the use of oxygen for a victim or the use of a Hare Traction Splint. The Emergency Medical Technician II - Paramedic is allowed to use intravenous drug therapy and portable defibrillating equipment at the direction of a base station physician or mobile intensive care nurse. The Standard or Advanced First Aider would not be allowed under any circumstances to use any of these advanced life support techniques. Their training is limited to the basic steps that the general public may take and then usually only after they have taken and passed the Red Cross first aid program.

There are classes of field pre hospital care personnel that have not yet been discussed that is the peace officer or firemen not assigned to special duty.

Any member of this class of pre-hospital care personnel could be trained as a Emergency Medical Technician I or Emergency Medical Technician-Paramedic. The major drawback with this is the great length of training involved.

For example, the Emergency Medical Technician II - Paramedic training takes eight hundred and twelve hours which is usually given to the candidate over a twenty two to twenty four week program. The training may be given continuously or broken up over a six month period of time depending on if the candidate is a full time student or working full time and taking the EMT-P program at night.

Summary

No curriculum currently exists that deals specifically with Emergency Medical Service Training for the peace officer which is the purpose of this project. From the literature reviewed some parts of existing courses may be appropriate for peace officers, however nothing has been put together that addresses the letter of the law as stated in section 13518 of the California Penal Code. The author intends to put together a training curriculum that addresses all the facets of the current legislation.

METHODOLOGY

Introduction

This section has detailed how the proposed project will be carried out. First, the objectives as outlined in the introductory section were restated. Next, the project design has been described and the populations to be sampled have been outlined. Following this, a description of the project setting has been provided and a calendar of events developed. Finally, this section has concluded with a summary.

Project Design

The design of the project is twofold. First, the training curriculum has been established to conform to all the provisions of section 13518 of the California Penal Code. This section related specifically to the training of California Peace Officers in the areas of first aid, cardiopulmonary resuscitation, vehicle extrication, and emergency child birth.

To accomplish this several training areas had to be identified. The following were proposed topic areas: An orientation to the EMS system; Legal aspects of EMS; Basic anatomy and medical terminology.

Examination and Assessment of the victim and scene; Cardiac and respiratory emergencies; First aid for traumatic injuries; First aid for specific injuries; First aid for environmental emergencies; First aid for obstetrical emergencies; Vehicle extrication; Short distance rescue and transfer; Cardiopulmonary Resuscitation; and Special medical emergencies.

The second aspect of this project has been to ensure that the training curriculum is constructed in a behavioral objective format. Along with this the project has had

to be constructed in such a manner that it is cost effective for the member agencies of POST to implement. In dealing with the time allotment and the monetary constraints the author has developed a curriculum that meets the needs of the average law enforcement agency in this state. As an example with a projected class time of four to forty eight hours a department of fifty personnel, making an average of fifteen dollars an hour, would cost between six hundred and seven hundred and twenty dollars to complete the training. While this amount seems small it does not take into consideration the costs of materials. Nor does it account for the need to pay over time to officers to cover the existing shifts while others are participating in the EMS training. Lastly that the training curriculum be realistic and workable when it addresses the areas of length of certification and what mechanism will be used for recertification. A training curriculum that grants too long of a certification period will not allow for the officer to retain the material. It is also unfair for the individual officer to have to sit through a long boring class to be recertified.

The project has consisted of a training curriculum for California Peace Officers. The curriculum consists of twenty one functional areas that will deal with all aspects of the Emergency Medical Service Training needed to comply with the requirements of section 13518 of the California Penal Code. Functional areas range from the legal aspects of emergency medical service training to emergency childbirth and vehicle extrication. The functional areas have been constructed in the behavioral objective format with a learning goal and performance objective included in each functional area. The evaluation instrument consists of a paper and pencil examination in conjunction with several real life scenarios. The scenarios have allowed for the testing of the students psychomotor skills. The scenario type of testing has also

allowed the instructor to evaluate the student in as a real life situation as can be duplicated.

The testing instrument has been a standardized instrument that was thoroughly tested on several sample classes prior to the final implementation.

The testing instrument has been divided into four parts and given to the students as the course progresses. This has allowed for constant feed back as to how the class is receiving the material.

In addition to a student guide book for this curriculum an instructor teaching manual has been constructed. Both of these guide books allowed for the student or instructor to make notes that can be used for the retraining sessions. As this curriculum is implemented it has been necessary to use a graduated deployment. This deployment allowed the journeyman level to take a refresher course of this curriculum or a challenge course rather than sitting through the entire curriculum. However, the refresher or challenge phase of the curriculum could only be taken once every year. Thus every officer would get the entire curriculum within three years of its implementation.

Populations and Locations

The targeted population in this project has been California Peace Officers. This population while quite diverse in make up has met all the same basic requirements for selection. These requirements include the following: members must be twenty one years of age if they are to function in a field setting; members must have graduated from high school or possess a GED certificate; members must pass a comprehensive medical examination; members must also successfully pass a written and oral examination; members must pass an evaluation conducted by a clinical

physiologist; members must satisfactorily complete a thorough background investigation; and finally, they must pass the physical agility test established by POST. Once a candidate has been selected for employment then they must complete a basic course of law enforcement training and pass a eighteen month probation period.

The location for the curriculum implementation has been law enforcement training academies, as well as community based training sites like community colleges. These locations have taken the approved curriculum and integrate it into the basic course of instruction for recruit officers or instruct the journeyman level peace officer as to the new training curriculum.

Calendar of Events

The events of this project proposal have occurred on or about the following dates and in the following order:

December	2	1988	Began research and curriculum development.
January	6	1988	Continued literature review.
February	3	1989	Completed review of literature.
March	3	1989	Develop the Curriculum using the Behavioral Objective format.
April	7	1989	Complete First draft of project for review by project advisors.
April	21	1989	Complete testing instruments for proposed project.
May	5	1989	Complete any suggested revisions made by project advisors of first draft of the curriculum.
May	12	1989	Complete research and write final draft of curriculum for review.
May	25	1989	Address any suggested revisions in final review.
June	5	1989	Present project for final approval.
September	21	1989	Binding of final project and distribution of copies.
December	5	1989	Projected graduation from Masters Program.

Costs and Budget

The cost of creating this training curriculum has been borne by the author. Primary costs will consist of the computer research, obtaining various research and reference material, obtaining the proper paper to print the project, having the binding completed, and typing or word processor time to complete the project. The author has been responsible for all costs incurred in the completion of this training curriculum.

Summary

The methodology section has proceeded in the following fashion: First the objectives of the proposed curriculum were outlined. The project design along with population and locations were discussed. Finally, the calendar of events was presented.

A RATIONALE FOR EMERGENCY MEDICAL SERVICE TRAINING for CALIFORNIA PEACE OFFICERS

California Penal Code Section 13518 has mandated that emergency medical training for peace officers will take place. Many times legislation is passed because of special interest groups or because it is a pet project of a legislator. In the case of section 13518 P.C. however, there is an overwhelming real need for this training. Every time an officer responds to a call, he or she may be facing having to provide emergency medical care to a victim of a gunshot wound, or a traffic accident or even assisting in the birth of a baby. There is obviously a clear need for this training.

Existing curricular materials are not suited for the kinds of care peace officers must provide. Existing materials are geared to the emergency medical technician or paramedic not the unique needs of a front line peace officer. The peace officer must be able to sustain the victim for the first critical minutes of an emergency until paramedics and advanced life support personnel can speed to the scene. Often it is this initial care that is the difference between life and death. Clearly, there is a need for the development of curricular materials to address this issue.

The training will take place at existing peace officer training academies and at various departments through the state. The primary students will be field and correctional peace officers. Obviously, the curriculum must be structured in a manner which will facilitate the teaching vagaries of a number of trainers, and it must be constructed so that a number of skills are reliably instilled in the officers. Clearly a competency based approach to instruction is highly appropriate to this endeavor.

I want to do this task for several reasons. First, I am charged with the production of these training materials. Secondly, I have considerable experience in the field of emergency medicine. Thirdly, I have made the study of competency based educational materials the major thrust of my graduate work at California State University at San Bernardino. Lastly, as a veteran peace officer, I want to continue to aid the effort of peace officers everywhere to save lives and to make our society a safer place.

GOALS FOR PROJECT CURRICULUM

Each project or job should have achievable goals for the participant to reach, this project is no different.

1. The student will acquire through cognitive and psychomotor instruction the skills required to function as a California Peace Officer in the area of emergency medical services.
2. The student will demonstrate to the instructor of record in the training class that he/she has the knowledge and skills to deal with the following areas of emergency medical services training: The EMS system, legal aspects of EMS training, basic anatomy and medical terminology, examination and assessment of the victim and scene, cardiac and respiratory arrest emergencies, first aid for traumatic injuries, first aid for specific injuries, first aid for environmental emergencies, first aid for obstetrical emergencies, cardiopulmonary resuscitation, and special medical emergencies.
3. All of the above areas must be completed to the satisfaction of the instructor and within the guidelines established to receive a passing written score.

EMERGENCY MEDICAL TRAINING

FOR

CALIFORNIA PEACE OFFICERS

Section 1

INTRODUCTION TO FIRST AID

1.1 **LEARNING GOAL:** The student will gain a working knowledge of standard first aid.

PERFORMANCE OBJECTIVE:

- 1.1.1 The student will identify the priority cases in First Aid and how to effectively care for these cases.
- 1.1.2 The student will demonstrate how to evaluate a victim of injury or illness as to what treatment may be required.
- 1.1.3 The student will inform the instructor how he/she would recognize hazardous situations and demonstrates the steps to take in eliminating or reducing these hazards.

RESOURCE MATERIAL:

I. DEFINITION

First Aid is the immediate care given to a person who has been injured or has been suddenly taken ill. It includes self help and home care if medical assistance is not available or is delayed. It includes well selected words of encouragement, evidence of willingness to help, and promotion of confidence by demonstration of competence.

II. EVALUATION OF VICTIM

A. Urgent Care - Primary Survey.

In case of serious injury or sudden illness, while help is being summoned, give immediate attention to the following first aid priorities:

1. Effect a prompt rescue only if necessary to protect the life of the victim or rescuer. (For example, remove an accident victim from water, from a fire, or from a garage or room containing carbon monoxide, smoke or noxious fumes.)
2. Ensure that the victim has an open airway and give mouth-to-mouth or mouth-to-nose artificial respiration, if necessary.
3. Begin C.P.R. if the victim is pulseless.
4. Control Severe bleeding.
5. Give first aid for poisoning, or ingestion of harmful chemicals.

Specific emergencies that require immediate first aid will be discussed fully in appropriate chapters in the text.

B. Additional first aid directions

Once emergency measures have been taken to ensure the victim's safety, the following procedures should be carried out:

1. Do not move a victim unless it is necessary for safety reasons. Keep the victim in the position best suited to his condition of injuries; do not let him get up or walk about.
2. Protect the victim from unnecessary manipulation and disturbance.
3. Avoid or overcome chilling by using blankets or covers, if available. If the victim is exposed to cold or dampness, place blankets or additional clothing over and under him.
4. Determine the injuries or cause for sudden illness. After immediate problems are under control:
 - a. Find out exactly what happened. Information may be obtained from the victim or from persons who were present and saw the accident, or saw the individual collapse in the case of sudden illness.
 - b. Look for an emergency medical identification, such as a card or bracelet, which may provide a clue to the victim's condition.

- c. If the victim is unconscious and has no signs of external injury, and if the above methods fail to provide identity, try to obtain proper identification either from papers carried in a billfold or purse, or from bystanders, so that relatives may be notified. (It is advisable to have a witness when searching for identification.)

C. Secondary Survey

Examine the victim methodically but be guided by the kind of accident or sudden illness and the needs of the situation. Have a reason for what you do.

1. Loosen constricting clothing but do not pull on the Victim's belt in case spinal injuries are present.
2. Open or remove clothing if necessary to expose a body part in order to make a more accurate check for injuries. Clothing may be cut away or ripped at the seams, but utmost caution must be used or added injury may result. Do not expose the victim unduly without protective cover, and use discretion if clothing must be removed.
3. Note the victim's general appearance, including skin discoloration, and check all symptoms that may give a clue to the injury or sudden illness. In the case of a victim with dark skin, change in skin color may be difficult to note. It may then be necessary to depend upon change in the color of

the mucous membrane, or inner surface of the lips, mouth, and eyelids.

4. Check the victim's pulse. If you cannot feel it at the wrist, check for a pulse of the carotid artery at the side of his neck.
5. Check to see if the victim is awake, stuporous, or unconscious. Does he respond to questions?
6. If the victim is unconscious, look for evidence of head injury. In a conscious person, look for paralysis of one side of the face or body. See if the victim shows evidence of a recent convulsion. (He may have bitten his tongue, producing a laceration.)
7. Check the expression of the victim's eyes and the size of his pupils.
8. Examine the victim's trunk and limbs for open or closed wounds or additional signs of fractures.
9. Check the front of the victim's neck to determine whether he is a laryngectomee. (Most laryngectomees carry a card or other identification stating that they cannot breathe through the nose or mouth.) Do not block the stoma (air inlet) of a laryngectomee when carrying out other first aid, since blockage could cause death from asphyxiation.

10. If poisoning is suspected, check for stains or burns about the victim's mouth and a source of poisoning nearby, such as pills, medicine bottles, household chemicals, or pesticides.

D. Carry out the indicated first aid:

1. Apply emergency dressings, bandages, and splints, as indicated.
2. Do not move the victim unless absolutely necessary.
3. Plan action according to the nature of the injury or sudden illness, the needs of the situation, and the availability of human and material sources.
4. Utilize proper first aid measures and specific techniques that, under the circumstances, appear to be reasonably necessary.
5. Remain in charge until the victim can be turned over to qualified persons (for example, a physician, an ambulance crew, a rescue squad, or a police officer), or until the victim can take care of himself or can be placed in the care of relatives.
6. Do not attempt to make a diagnosis of any sort or to discuss a victim's condition with bystanders or reporters.
7. Above all, as a first aid worker, you should know the limits of your capabilities and must make every effort to avoid

further injury to the victim in your attempt to provide the best possible emergency first aid care.

III. VALUE OF FIRST AID TRAINING

- A. Help provided to others.
- B. Self-help.
- C. Disaster Preparation Community Involvement.

IV. GENERAL CONSIDERATIONS AND DIRECTIONS

- A. Each emergency will be different.
- B. Cause and effect.
 - 1. Force-cuts and fractures
 - 2. Fire
 - 3. Breathing - Brain damage.

Section 2

SHOCK

2.1 LEARNING GOAL: The student will possess the knowledge and skills to identify the victim suffering from shock and how to treat them.

PERFORMANCE OBJECTIVE:

2.1.1 The student will choose from a list of indicators those factors that are signs or symptoms of shock.

2.1.2 The student will list the emergency care principles for shock management, which will consist of, but not be limited to:

- (1) Body positioning
- (2) Body temperature control
- (3) Officer demeanor

RESOURCE MATERIAL:

I. DEFINITION

Shock is a condition resulting from a depressed state of many vital body functions, a depression that could threaten life even though the victim's injuries would not otherwise be fatal. Injury related shock, commonly referred to as traumatic shock, is decidedly different from electrical shock, insulin shock, and other special forms of shock.

II.CAUSES

A. Shock may be caused by severe injuries of all types; hemorrhage, or loss of body fluids other than blood (as in prolonged vomiting, dysentery, or burns) ; infection; heart attack or stroke; or poisoning by chemicals, gases, alcohol, or drugs. Shock also results from lack of oxygen, caused by obstruction of air passages or injury to the respiratory system.

B. The degree of shock is increased by abnormal changes in body temperature and by poor resistance of the victim to stress.

C. Shock is aggravated by pain, by rough handling, and by delay in treatment.

III.SIGNS AND SYMPTOMS

A. Early stages in the early states of shock, the body compensates for a decreased blood flow to the tissues by constricting the blood vessels in the skin, soft tissues, and skeletal muscles. The following signs may develop as a result:

- 1.The skin is pale (or bluish) and cold to the touch. In the care of victims with dark skin, it may be necessary to rely primarily on the color of the mucous membranes on the inside of the mouth or under the eyelids, or of the nail beds.
2. The skin may be moist and clammy if perspiration has occurred.
3. The victim is weak.

4. The pulse is usually quite rapid (over 100) and often too faint to be felt at the wrist, but perceptible in the carotid artery at the side of the neck, or in the femoral artery at the groin.

5. The rate of breathing is usually increased; it may be shallow, possibly deep, and irregular.

6. If there has been injury to the chest or abdomen, breathing will almost certainly be shallow, because of the pain involved in breathing deeply.

7. A victim in shock from hemorrhage may be restless and anxious (early signs of oxygen lack), thrashing about, and complaining of severe thirst.

8. The victim may vomit or retch from nausea.

B. Late stages

If the victim's condition deteriorates, the following additional signs may be noted.

1. The victim becomes apathetic and relatively unresponsive.

2. The victim's eyes are sunken, with a vacant expression, and his pupils may be widely dilated.

3. Some of the blood vessels in the skin may be congested, producing a mottled appearance, which indicates the victim's blood pressure has fallen to a very low level.

4. If untreated, the victim eventually loses consciousness, his body temperature falls, and he may die.

IV. TREATMENT OBJECTIVES

- A. To improve circulation of the blood
- B. To ensure an adequate supply of oxygen
- C. To maintain normal body temperature

V. FIRST AID

Give urgently necessary first aid immediately to eliminate the causes of shock, such as stoppage of breathing, hemorrhaging, or severe pain.

- A. Steps for preventing shock and for giving first aid.

1. Keep the victim lying down.
2. Cover him only enough to keep him from losing body heat.
3. Get medical help as soon as possible.

- B. Body Position

1. The position for a victim must be based on his injuries.

Generally, the most satisfactory position for the injured person will be lying down to improve the circulation of blood.

2. If injuries of the neck or lower spine are suspected, do not move the victim until he is properly prepared for transportation, unless it is necessary to protect him from further injury or to provide urgent first aid care.

3. A victim with severe wounds of the lower part of the face and jaw, or who is unconscious, should be placed on his side to allow drainage of fluids and to avoid blockage of the airway by vomits and blood. Extreme care must be taken to ensure an open airway and to prevent asphyxia. When there is no danger of aspiration of fluids, a victim who is having difficulty breathing may be placed on his back with his head and shoulders raised.

4. A person with a head injury may be kept flat or propped up, but his head must not be lower than the rest of his body.

5. If in doubt concerning the proper position of the victim based on injuries sustained, keep him lying flat.

6. Victims in shock may improve if the feet (or foot of the stretcher) are raised from 8 to 12 inches. If the victim has increased difficulty in breathing or experiences additional pain after his feet are raised, lower the feet again.

C. Regulating body temperature

Keep the victim warm enough to avoid or overcome chilling. If the victim is exposed to cold or dampness, blankets or additional clothing should be placed over and under him to prevent chilling. No attempt should be made to add extra heat, because raising the surface temperature of the body is harmful.

D. Administering fluids

1. Giving fluids by mouth has value in shock, but fluids should only be given when medical help is not available within a reasonable time. Fluids should not be given, however, when victims are unconscious, are vomiting or are likely to vomit, or are having convulsions, since victims in such states may aspirate fluids into the lungs.
2. Do not give the fluids when a victim is likely to require surgery or general anesthetic, or when he appears to have a brain or abdominal injury.
3. Fluids may be given by mouth only if medical care is delayed for an hour or more and no contraindications exist. Water that is neither hot nor cold preferably a salt soda solution (containing 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water) should be given as follows:
 - a. An adult victim should be given about 4 ounces (1/2 glass) every 15 minutes.
 - b. Approximately 2 ounces should be given to children aged from 1 to 12, and 1 ounce to infants of 1 year or less.
 - c. Discontinue fluids if the victim becomes nauseated or vomits.

Section 3

RESPIRATORY EMERGENCIES

3.1 **LEARNING GOAL:** The student will have a working knowledge of respiratory emergencies, and how to deal with them.

PERFORMANCE OBJECTIVE:

3.1.1 The student will verbally or in writing identify methods used in evaluating the function of the respiratory systems.

3.1.2 The student will list the common causes of respiratory failure, these causes to include anatomic obstructions, mechanical obstructions, toxic gases, and oxygen depletion.

3.1.3 Using fellow student in the role of a patient, the student will, within a period of 60 seconds, demonstrate in proper sequence the procedure for conducting a primary survey on:

(1) A conscious person

(2) An unconscious person

RESOURCE MATERIAL:

I. DEFINITIONS

A respiratory emergency is one in which normal breathing stops or in which breathing is so reduced that oxygen intake is insufficient to support life.

Artificial respiration is a procedure for causing air to flow into and out of a person's lungs when his natural breathing is inadequate or ceases.

II. CAUSES OF RESPIRATORY FAILURE

A. Anatomic obstruction

1. Obstruction by tongue

The most common cause of respiratory emergency is interference with breathing caused by the tongue's dropping back and obstructing the throat.

2. Other causes of obstruction that constricts the air passages.

- a. Acute asthma
- b. Croup
- c. Diphtheria
- d. Spasm of the larynx
- e. Swelling after burns of the face
- f. Swallowing of corrosive poisons
- g. Direct injury caused by a blow

B. Mechanical obstruction

- 1. Partial or complete blockage of the air passage by a solid foreign object lodged in the pharynx or in any part of the airway.

Sudden death may occur from obstruction of the air passages directly or by pressure of a foreign body within the esophagus, which lies behind the trachea. In some instances of choking on food, a diagnosis of heart attack has been made on the basis of the victim's sudden collapse with marked chest pain, difficulty in breathing, and bluish discoloration of the face. A true life-threatening emergency exists when a person is choking and having difficulty in breathing. If he is unable to speak, it is a sure indication that the larynx is obstructed.

2. Accumulation of fluids in the back of the throat (mucus, blood, or saliva, for example) .

3. Inhalation of vomitus.

C. Air depleted of oxygen or containing toxic gases.

1. Causes of asphyxia

Asphyxia may occur from breathing air that does not contain sufficient oxygen, or air containing carbon monoxide or other toxic gas. Natural, slow oxidation processes sometimes remove oxygen from the air in such places as wells, cisterns, sewers, mines, and silos. If air does not contain oxygen, it will not support life, whether toxic gases are present or not. Plastic bags and other materials that may cause asphyxia when placed over the nose and mouth should be kept out of the reach of small children. Refrigerators and freezers, frequently implicated in accidents to

children, should never be abandoned unless the doors have been removed.

2. Explosion hazard

In addition to the dangers of asphyxia from carbon monoxide, or from displacement of oxygen by natural oxidation processes or by other gases, there is often an explosion hazard. Combustible gases that accumulate in confined spaces such as mines, cisterns, and sewers, or in rooms where natural or manufactured gas is free in the air are explosive in certain concentrations. The explosion may result if a flame is introduced, if static electricity is discharged, or if an electric switch, doorbell, telephone, or other device is used.

3. Additional causes of respiratory failure

- a. Electrocution
- b. Drowning
- c. Circulatory collapse (shock)
- d. Heart disease
- e. External strangulation, as in hanging
- f. Compression of the chest (caused, for example, by a mine cave in)
- g. Disease or injury to the lungs (Inadequate ventilation may be caused by injuries that collapse or compress lung

tissue, injuries that permit air to enter through a sucking wound of the chest wall, accumulation of blood in the chest cavity from hemorrhage, or by inflammatory diseases of the lung such as pneumonia.)

- h. Poisoning by respiration depressing drugs, such as morphine, opium, codeine, barbiturates, and alcohol.

Section 4

OBSTRUCTED AIRWAY

4.1 **LEARNING GOAL:** The Student will acquire a working knowledge and possess the skills needed to handle emergency airway obstructions.

PERFORMANCE OBJECTIVES:

4.1.1 The student will list the common causes of foreign body obstruction and the appropriate emergency care for each.

4.1.2 The student will, using a role player, identify within 60 seconds:

- (1) A partial airway obstruction
- (2) Complete airway obstruction
- (3) Conscious victim
- (4) Unconscious victim

4.1.3 Once this identification has been completed the student will demonstrate in proper sequence the Emergency First Aid treatment for the identified problem.

RESOURCE MATERIAL:

I. RECOGNITION OF FOREIGN BODY OBSTRUCTION

Because early recognition of airway obstruction is the key to successful management, it is important to differentiate this emergency from fainting, stroke, heart attack, epilepsy, drug

overdose, or other conditions which cause sudden respiratory failure and which are managed differently.

- A. Foreign bodies may cause either partial airway obstruction or complete airway obstruction. With partial airway obstruction, the victim may be capable of either "good air exchange" or "poor air exchange." With good air exchange, the victim can cough forcefully, although frequently there is wheezing between the coughs. As long as with good air exchange continues, the victim should be allowed and encouraged to persist with spontaneous coughing and breathing efforts. At this point, do not interfere with his attempts to expel the foreign body. Poor air exchange may occur initially, or good air exchange may progress to poor air exchange, as indicated by a weak, ineffective cough, high-pitched noises while inhaling (such as crowing like noise), increased respiratory difficulty, and possibly cyanosis (bluish color of skin, fingernail beds, and inside mouth). At this point manage the partial obstruction as though it were a complete airway obstruction.

With complete airway obstruction the victim is unable to speak, breathe, or cough. He may clutch his neck (universal distress signal). Movement of air will be absent and prompt action is required. The oxygen in the lungs is depleted because the obstructed airway prevents entry into the lungs, the brain develops oxygen lack and unconsciousness will occur and death will follow rapidly.

II. MANAGEMENT OF THE OBSTRUCTED AIRWAY

A. Manual Maneuvers

Manual maneuvers are recommended for relieving foreign body airway obstruction: manual thrusts, and finger sweeps.

The following provides a description of each maneuver with the recommended position and method of application.

III. MANUAL THRUSTS

Manual Thrusts consist of a rapid series of six to ten thrusts to the upper abdomen (abdominal thrust) or lower chest (chest thrust) that force air out of the lungs creating an artificial cough intended to move the foreign body. Each thrust should be delivered with the intent of relieving the obstruction without having to complete the full series.

A. Abdominal Thrust

Victim Standing or Sitting

1. Stand behind the victim and Wrap your arms around his/her waist.
2. Grasp one fist with your other hand, and place the thumb side of your fist against the victim's abdomen, in the midline between the waist and the ribcage.
3. Press your fist four times into the victim's abdomen with a quick inward and upward thrust.

Victim Lying

1. Position the victim lying on his back with your knees close to his hips. Open the airway and turn head up.
2. Place the heel of one hand against the victim's abdomen, in the midline between the waist and ribcage.
3. Move forward so that your shoulders are directly over the victim's abdomen.

4. Position of Rescuer

(Two positions of the rescuer are described. The rescuer may do this maneuver in either position.)

- a. Rescuer astride victim. In this position the rescuer straddles the hips or one thigh of the supine victim.
 - b. The rescuer alongside the victim. In this position the rescuer's knees are close to the victim's hip on either the right or the left side of the victim.
5. Press into the victim's abdomen with a quick inward and upward thrust. Do not press to either side.

Victim Alone

The victim who is alone can perform the maneuver on him/herself in the following manner: Press a fist into the upper abdomen and with a quick upward thrust as described for the victim standing, or lean forward and press the abdomen quickly

over any firm object such as the back of a chair, table or porch railing.

B. Chest Thrust

As an alternate technique to the abdominal thrust, this maneuver may be applied to the chest. It is particularly useful when the abdominal girth is so large the rescuer cannot fully wrap his arms around the victim's abdomen as with gross obesity, or when pressure applied directly to the victim's abdomen is likely to cause complications, as in advanced pregnancy.

Victim Standing or Sitting

1. Stand behind the victim, place your arms directly under the victim's armpits, and encircle the victim's chest.
2. Place the thumb side of your fist on middle of the breastbone, but not on the xiphoid process or the margins of the rib cage.
3. Grasp your fist with your other hand and exert quick backward thrusts.

Victim Lying

1. Place the victim on his back and kneel close to the side of his body. Open the airway and turn head up.
2. Hand position for an application of chest thrust is the same as that for applying closed chest heart compression. (Heel of hand on lower half of sternum.)

3. Exert four quick downward thrusts that will compress the chest cavity.

Manual Removal of Foreign Bodies

If the presence of a foreign body is strongly suspected or can be seen in the mouth, it should be removed with the fingers. If it cannot be seen, the combination of back blows and manual thrusts may expel it or dislodge it so that it is more accessible for removal by the fingers.

It is difficult to remove foreign bodies from the airway with your fingers, and in most cases, it is impossible to open the victim's mouth and insert your fingers for this purpose unless he or she is unconscious. In some cases, especially with infants and small children, an adult's finger may force a foreign body deeper into the throat and cause complete airway obstruction. However, large foreign bodies can sometimes be dislodged and removed if they are at the level of or above the epiglottis.

C. Finger Sweep

1. With the head up, open the victim's mouth by grasping both the tongue and lower jaw between your thumb and fingers and lifting ("tongue jaw lift"). This action draws the tongue away from the back of the throat and away from a foreign body that may be lodged there. This alone may partially relieve the obstruction. If you are unable to open the mouth with the "tongue jaw lift" technique, use the crossed-finger technique to open the airway.

Open the mouth by crossing your finger and thumb and push the teeth apart.

2. Insert the index finger of your other hand down along the inside of the cheek and deeply into the throat to the base of the tongue. Then use a hooking action to dislodge the foreign body and maneuver it into the mouth so it can be removed. Sometimes it is necessary to use the index finger to push the foreign body against the opposite side of the throat to dislodge and lift it. Be Careful not to force the object deeper into the airway. If the foreign body comes up within reach, grasp and remove it.

IV. DEVICES

The following devices are recommended for use in relieving foreign body airway obstruction. THE USE OF THESE DEVICES IS RESTRICTED TO THOSE PROPERLY TRAINED IN THEIR USE AND APPLICATION.

Two types of conventional forceps: Kelly clamp and Magill Forceps should be used only with direct visualization of the foreign body. Either a laryngoscope or tongue blade and flashlight can be used to permit direct visualization.

A. SEQUENCING OF PROCEDURES FOR EMERGENCY RELIEF OF FOREIGN BODY AIRWAY OBSTRUCTION.

The recommended sequence of procedures for emergency relief of airway obstruction varies according to: (1) whether the

emergency Involves a conscious victim suspected of having a complete obstruction of the airway, an obvious choking victim who has been treated and who becomes unconscious or an unwitnessed unconscious victim; and (2) the degree of training of the rescuer, whether he is part of the lay public or trained in more advanced emergency medical care procedures.

Note: In following the sequence of procedures, the procedures are determined ineffective if, after their application, the victim does not do at least one of the following 1) resume spontaneous breathing; 2) regain consciousness: 3) begin to regain normal coloring of skin; 4) expel the foreign body from the mouth or into the mouth where it can be seen. The procedures are effective if, after their application, the victim does at least one of the above. If at any stage a foreign body is seen in the mouth, attempt to remove it by finger sweeps.

1. Conscious Victim

In the conscious victim of foreign body airway obstruction, immediate recognition and proper action are essential. If the victim has good air exchange with only partial obstruction and is still able to speak or cough effectively, do not interfere with his or her attempts to expel a foreign body.

The following sequence of maneuvers should be performed on the conscious victim:

- a. Identify complete airway obstruction by asking if he is able to speak.
- b. Four Back Blows in rapid succession.
- c. Four Manual Thrusts.
- d. Repeat four back blows and four manual thrusts until they are effective or until the victim becomes unconscious.

If the victim becomes unconscious, follow the sequence of maneuvers described below.

2. Choking Victim Who Becomes Unconscious

The rescuer should call for help, open the airway and attempt to ventilate. If he is unsuccessful with the ventilation, he should quickly perform the following:

- a. If a second person is available, he should activate the EMS System.
- b. Apply 4 back blows in rapid succession.
- c. Apply 4 manual thrusts.
- d. Apply the finger sweep. Dentures may need to be removed to improve the finger sweep.

- e. Reposition the head, open the airway and attempt to ventilate. If the victim cannot be ventilated
- f. Repeat steps 2, 3, 4, and 5 until successful or ACLS is available.

3. Unconscious victim and the cause is not known

If the rescuer has found an unconscious victim, called for help, opened the airway, established breathlessness, attempted to ventilate and cannot, quickly perform the following sequence:

- a. Reposition the head. Try again to ventilate, If unsuccessful and a second person is available, he should activate the EMS System.
- b. Four Back Blows in rapid succession.
- c. Four Manual Thrusts.
- d. Finger Sweep. May need to remove dentures to improve finger sweep.
- e. Reposition the head and attempt to Ventilate. If the victim cannot be ventilated. . .
- f. Repeat steps 2, 3, 4 and 5 until successful or ACLS is available.

If successful in removing the foreign body, perform mouth-to-mouth ventilation or cardiopulmonary resuscitation if

necessary. If the victim begins spontaneous respiration, further examination by a physician is recommended.

NOTE:

- 1) As the Victim becomes more deprived of oxygen (anoxic), the muscles will relax, and maneuvers that were previously ineffective may become effective.
- 2) When the muscles relax or a foreign body is partially dislodged and the airway is partially open, slow, full, and forceful ventilation may keep a victim alive while bypassing the Obstruction.
- 3) If there is vomitus in the mouth or throat, turn the head and body to the side, wipe material out quickly, and proceed with the sequence.

V. ABDOMINAL THRUSTS - CHEST THRUSTS

There are no significant differences in the airway flow, pressure, and volume between abdominal and chest thrusts. The chest thrust is preferred for special circumstances, i.e., pregnancy, or marked obesity. A significant consideration in either abdominal or chest thrust is possible damage to internal organs, such as rupture or laceration of abdominal or thoracic viscera. The rescuer's hands should never be placed on the xiphoid process of the sternum, or on the lower margins of the rib cage. They should be below this area for abdominal thrust and above this area for chest thrust. Use of the

abdominal thrust instead of the chest thrust in the older aged victims might avoid the fracture of brittle ribs. Regurgitation may occur as a result of abdominal thrust.

Training and proper performance should minimize these problems.

VI. UNCONSCIOUS SUPINE (face up) VICTIM - SIDE

POSTION - ASTRIDE POSITION OF RESCUER

One position for the rescuer to perform manual thrusts is at the side of the unconscious victim. At his side, the rescuer has more maneuverability, and is in position to perform many procedures, including chest thrusts, abdominal thrusts, back blows, turning the entire body if regurgitation occurs, finger sweeps, head tilt to open the airway and mouth- to-mouth ventilation. Of these only the abdominal thrust can be performed while astride the victim. If the rescuer is astride the victim, he has a natural midabdominal position and is thus unlikely to direct the thrust to the right or left, which would result in liver or spleen damage. While a small rescuer astride a large victim can use his weight to assure an effective abdominal thrust in the proper direction toward the diaphragm, proper hand and body position by a rescuer at the side can also provide for the effective thrust.

VII. OTHER

A. The general public should be taught and encouraged to use the "distress signal of choking."

1. Clutching the neck between the thumb and index finger.

Section 5

WOUNDS

5.1 **LEARNING GOAL:** The student will have a working knowledge of wounds and their first aid treatment, along with infection and contamination.

PERFORMANCE OBJECTIVE:

5.1.1 The student will define the general classifications and types of open and closed wounds.

5.1.2 The student will demonstrate the proper techniques for blood control including but not limited to:

- (1) Direct pressure
- (2) Elevation
- (3) Pressure on supply artery
- (4) Tourniquets

5.1.3 The student will list the signs, symptoms, and emergency care needed for open and closed wounds.

5.1.4 The student will list the measures to take in caring for open wounds to limit or stop contamination and infections.

RESOURCE MATERIAL:

I. DEFINITION

A wound is a break in the continuity of the tissues of the body, either internal or external.

A. Classification of wounds

1. Open

An open wound is a break in the skin or the mucous membrane.

2. Closed

A closed wound involves injury to underlying tissues without a break in the skin or a mucous membrane.

B. Types of open wounds

1. Abrasions

2. Incisions

3. Lacerations

4. Punctures

5. Avulsions

II. COMMON CAUSES

Wounds usually result from external physical forces. The most common accidents resulting in open wounds are motor vehicle accidents, falls, and mishandling of sharp objects, tools, machinery, and weapons.

III. SYMPTOMS

A. Abrased wounds

1. The outer layers of the protective skins are damaged.

Abrased wounds usually result when the skin is scraped against a hard surface.

2. Bleeding is limited
3. Danger of contamination and infection exists.

B. Incisions

1. An incised wound, or cut, frequently occurs when body tissue is cut on knives, rough edges of metal, broken glass, or other sharp objects.
2. Bleeding may be rapid and heavy.
3. Deep cuts may damage muscles, tendons, and nerves.

C. Lacerations

1. A lacerated wound displays jagged, irregular, or blunt breaking or tearing of the soft tissues, and is usually caused when great force is exerted against the body.
2. Bleeding may be rapid and extensive.
3. Destruction of tissue is greater in a lacerated wound than in a cut.

4. Deep contamination of the wound increases the chance for later infection.

D. Punctures

1. A punctured wound is produced by an object piercing skin layers, creating a small hole in the tissues. Puncture producing objects include bullets and pointed objects, such as pins, nails, and splinters.
2. External bleeding is usually quite limited.
3. Internal damage may have resulted to the organs, causing internal bleeding.
4. The hazard of infection is increased because the flushing action of external bleeding is limited.
5. Tetanus may develop.

E. Avulsions

1. An avulsed wound results when tissue is forcibly separated or torn from the victim's body.
2. An incised wound, a lacerated wound, or both will usually occur when a body part is avulsed.
3. There will be heavy, rapid bleeding.
4. An avulsed body part may be successfully reattached to the victim's body by a surgeon. Send the body part along with the victim to the hospital.

5. Avulsed wounds occur in accidents such as motor vehicle wrecks, gunshots, explosions, animal bites, and other body crushing injuries.

IV. FIRST AID FOR OPEN WOUNDS

- A. Stop the bleeding immediately.
- B. Protect the wound from contamination and infection.
- C. Provide shock care.
- D. Obtain medical attention.

V. FIRST AID FOR SEVERE BLEEDING

- A. Need for immediate action

Shock and loss of consciousness in a victim may occur from the rapid loss of as little as a quart of blood. Because it is possible for a victim to bleed to death in a very short period of time, a first aider should stop any large, rapid loss of blood immediately and treat for shock.

- B. Techniques to stop severe bleeding (described in order of preference)

1. Direct Pressure

- a. Direct pressure by hand over a dressing is the preferred method for the control of severe bleeding, since it prevents loss of blood from the body without interference with normal blood circulation. In an emergency, in the absence of

compresses, the bare hand or fingers may be used, but only until a compress can be applied.

- b. Apply direct pressure by placing the palm of the hand on a dressing directly over the entire area of an open wound on any surface part of the body. In most instances this technique will stop the bleeding.
- c. A thick pad of cloth held between the hand and the wound helps to control the bleeding by absorbing the blood and allowing it to clot.
- d. Do not disturb blood clots after they have formed within the cloth. If blood soaks through the entire pad without clotting, do not remove the pad, but add additional thick layers of cloth and continue the direct hand pressure even more firmly.
- e. On most parts of the body, a pressure bandage can be placed to hold pads of cloth over a severely bleeding open wound and free the hands of the first aider for other emergency action.
- f. To apply the pressure bandage, place and hold the center of the bandage or strip of cloth directly over the pad on the wound; maintain a steady pull on the bandage to hold the pad firmly in place as you wrap both ends of it around the

body part and then tie the bandage with the knot directly over the pad.

2. Elevation

- a. Unless there is evidence of a fracture, a severely bleeding open wound of the hand, neck, arm, or leg should be elevated, that is, the injured part of the body should be raised above the level of the victim's heart.
- b. Elevation uses the force of gravity to help reduce blood pressure in the injured area and thus aids in slowing down the loss of blood through the wound. However, direct pressure on a thick pad over the wound must be continued.

3. Pressure on the supplying artery

- a. If severe bleeding from an open wound of the arm or leg does not stop after the application of direct pressure plus elevation, the pressure point technique may be required.
- b. Use of the pressure point technique temporarily compresses the main artery (which supplies blood to the affected limb) against the underlying bone and nearby tissues. The technique also stops circulation within the limb.
- c. If the use of a pressure point should be necessary, do not substitute its use for direct pressure and elevation, but use the pressure point in addition to those techniques.

- d. As a rule, do not use a pressure point in conjunction with direct pressure and elevation any longer than necessary to stop the bleeding. Be prepared, however, to reapply at a pressure point if bleeding recurs.
- e. Use the brachial artery for the control of severe bleeding from an open wound.
 - (1) Apply pressure over the brachial artery, forcing it against the arm bone. The pressure point is located on the inside of the arm in the groove between the biceps and the triceps, about midway between the armpit and the elbow.
 - (2) To apply pressure on the brachial artery, grasp the middle of the victim's upper arm, your thumb on the outside of his arm and your other fingers on the inside. Press your fingers toward your thumb to create an inward force from opposite sides of the arm. Use the flat, inside surface of your fingers not your fingertips. This pressure inward holds and closes the artery by compressing it against the arm bone.
- f. Use the femoral artery for the control of severe bleeding from an open leg wound.
 - (1) Apply pressure on the femoral by forcing the artery against the pelvic bone. The pressure point is located on the front, center part of the diagonally slanted "hinge" of

the leg, in the crease of the groin area, where the artery crosses the pelvic bone on its way to the leg.

- (2) To apply pressure on the femoral artery, position the victim flat on his back, if possible, and place the heel of your hand directly over the pressure point. Then lean forward over your straightened arm to apply the amount of pressure needed to close the artery. Keep your arm straight to prevent arm tension and muscular strain while you apply this technique. If bleeding is not controlled, it may be necessary to compress directly over the artery with the flat of the fingertips and apply additional pressure over the fingertips with the heels of the other hand.

4. Tourniquet

The use of a tourniquet is dangerous, and the tourniquet should be used only for a severe, life hemorrhage that cannot be controlled by other means. Tourniquets are used far too often and are rarely required; they should not be used except in critical emergencies when direct pressure on appropriate pressure point fails to stop bleeding. The decision to apply a tourniquet is in reality a decision to risk sacrifice of a limb in order to save life. Once a tourniquet is applied, care by a physician is imperative. (NOTE: A tourniquet should be at least 2 inches wide.)

- a. Place the tourniquet just above the wound; do not allow it to touch the wound edges. If the wound is in a joint area or just below, place the tourniquet immediately above the joint.
- b. Wrap the tourniquet band tightly around the limb twice and tie a half knot.
- c. Place a short, strong stick, or similar object that will not break, on the overhand knot and tie two additional overhand knots on top of the stick.
- d. Twist the stick to tighten the tourniquet until bleeding stops
- e. Secure the stick in place with the loose ends of the tourniquet, a strip of cloth, or other improvised material.
- f. Make a written note of the location of the tourniquet and the time it was applied and attach the note to the victim's clothing.
- g. Once the serious decision has been made to apply the tourniquet, the tourniquet should not be loosened except on the advice of a physician.
- h. Treat the victim for shock, and give necessary first aid for other injuries.

Do not cover a tourniquet.

VI. PREVENTION OF CONTAMINATION AND INFECTION

Open wounds are subject to contamination and infection. The danger of infection can be prevented or lessened by taking the appropriate first aid measures, depending upon the severity of bleeding.

A. Safeguards

When a dressing has been applied to control bleeding, whether bleeding has been severe or not, safeguards must be taken.

1. Do not remove or disturb the cloth pad initially placed on the wound.
2. Do not attempt to cleanse the wound, since the victim requires medical care.
3. Attend to shock before and during transportation.
4. Immobilize the injured area.
5. When possible, adjust the victim's lying position so that the affected limb can be elevated.

B. Measures to take with wounds without severe bleeding.

Wounds without severe bleeding that do not involve tissues deeper than the skin should be cleansed thoroughly. There will be some contamination, and it should be removed before the injury is dressed and bandaged, especially if medical attention is delayed. Removal of

foreign materials in muscle or deep tissue should always be carried out by a physician.

1. To cleanse a wound, wash your hands thoroughly with soap and water. Use ordinary hand soap or mild detergent.
2. Wash in and around the victim's wound to remove bacteria and other foreign matter.
3. Rinse the wound thoroughly by flushing with clean water, preferably running tap water.
4. Blot the wound dry with a sterile gauze pad or a clean cloth.
5. Apply a dry sterile bandage or clean dressing and secure it firmly in place.
6. Caution the victim to see a physician promptly if evidence of infection appears.
7. A physician may advise additional home remedies for the care of small wounds.

C. Removal of foreign objects

In small open wounds, wood splinters and glass fragments often remain in the skin tissues or in tissues just beneath the surface. Such objects, as a rule, only irritate the victim, but unless they are removed can cause infection.

1. Use tweezers sterilized over a flame or in boiling water, to pull out any foreign matter from the surface tissue.

2. Objects embedded just beneath the skin can be lifted out with the tip of a needle that has been sterilized in rubbing alcohol or in the heat of a flame.
3. Foreign objects, regardless of size, embedded deeper in the tissues should be left for removal by a physician.
4. The fishhook is probably one of the most common types of foreign objects that may penetrate the skin. Often, only the point of the hook enters, not penetrating deeply enough to allow the barb to become effective; in this case the hook can be removed easily by backing it out. If the fishhook goes deeper and the barb becomes embedded, the wisest course is to have a physician remove the hook. If medical aid is not available, remove the hook by pushing it through until the barb protrudes. Using a cutting tool, cut the hook either at the barb or at the shank and remove it. Cleanse the wound thoroughly and cover it with an adhesive compress. A physician should be consulted as soon as possible because of the possibility of infection, especially tetanus.
5. Some penetrating foreign objects, such as sticks or pieces of metal, may protrude loosely from the body. Some penetrating objects, such as a stake in the ground or a spike of a fence, may be fixed and cause the victim to become impaled. Under no circumstances should the victim be pulled loose from a fixed object. Obtain help at once, preferably from ambulance or rescue personnel equipped to handle the problem. If the object

is fixed or protrudes more than a few inches from the body, it should be left in place, be cut off at a distance from the skin, and be secured carefully to prevent movement that could cause further damage. If the victim must be transported, immobilize the protruding end with massive dressings around the protruding part, and then transport the victim to a hospital without delay and in the most comfortable manner possible.

D. Dressing the wound

A dressing is a cover placed over a wound to protect it from additional injury and contamination, and to assist in the control of bleeding. Bandaging a wound holds the dressing in place, assists in controlling the bleeding, offers support, and promotes restraint of movement.

E. Infection

The period of healing after an injury may be greatly lengthened by infection, which is the result of invasion and growth of bacteria within the tissues of the body. If bacteria gets inside tissues of the body and breaks in the skin or mucous membranes, serious infection may develop within hours or days following an injury. The threat of tetanus infection, or lockjaw, must never be overlooked. Ask your physician whether or not a tetanus immunization or tetanus toxoid booster injection may be needed.

1. Symptoms

- a. Swelling of the affected part
- b. Redness of the affected part
- c. A sensation of heat
- d. Throbbing pain
- e. Tenderness
- f. Evidence of pus, either collected beneath the skin or draining from the wound
- g. Fever
- h. Swollen lymph glands, or "kernels," in the groin (leg infection) , in the armpit (arm infection) , or in the neck (infection in the head)
- i. Red streaks leading from the wound is an indication that the infection is spreading through the lymphatic circulation channels

2. Interim emergency care

Prompt medical care is needed for an infected wound, but if any lengthy delay must occur before a physician can see the victim, the following temporary steps should be taken:

- a. Keep victim lying down and quiet, and immobilize the entire infected area.

- b. Elevate the affected body part, if possible.
- c. Apply heat to the area with hot water bottles, or by placing warm, moist towels or cloths over the wound.
- d. Do not delay efforts to get medical care for the victim. The above are interim measures only.

VII. BITES

Injuries produced by animal or human bites may cause punctures, lacerations, or even avulsions. Not only is care needed for open wounds but also consideration must be given to the danger of infection, especially rabies.

A. Human

Human bites that break the skin may become seriously infected, because the mouth is heavily contaminated with bacteria. Cleanse the wound thoroughly, cover it, and seek medical attention.

B. Animal

The bite of any animal, whether it is a wild animal or a pet, may result in an open wound. Dog and cat bites are common. Although a dog bite is likely to cause more extensive tissue damage than a cat bite, the cat bite may be more dangerous, because a wider variety of bacteria is usually present in the mouth of a cat. Many wild animals, especially bats, raccoons, and

rats, transmit rabies. Rabies can be transmitted even when a rabid animal licks an existing open wound on a human or a nonrabid animal. Tetanus is an added danger in animal bites. Any animal bite carries a great risk of infection. There is no known cure for rabies, in human beings or in animals, once its final state symptoms develop. If the animal proves to be rabid, vaccine therapy must be given to build up body immunity in the victim in time to prevent the disease.

1. A bite on the face or neck Should receive immediate medical attention.
2. Every effort must be made to restrain any suspected rabid animal so that it can be kept under observation to determine whether or not it develops the final stages of rabies. Find out from local health authorities how long a live animal suspected of having rabies should be observed.
3. Do not kill the animal unless absolutely necessary. If the animal has to be killed, have the body examined for rabies. If killing is necessary, take precautions not to damage the animal's head.
4. If a suspected rabid animal cannot be caught or found and thus cannot be identified and observed, arrange for immediate medical care for any person it has bitten.

5. Injections are effective in preventing rabies in 95 percent of victims.
6. In the meantime, before the physician takes charge, thoroughly wash the wound with soap and water, flush the bitten area, and apply a dressing.
7. Make sure that the victim avoids movement of the affected part until he has been attended by a physician.

VIII. CLOSED WOUNDS

A. Characteristics

1. A closed wound may occur anywhere within the body.
2. There is no break in the skin.
3. Blood is not lost through the skin, but may flow through outer openings of body cavities.
4. Closed wounds are less likely to become infected than are open wounds, since they are subject to less contamination.
5. Many closed wounds are relatively small injuries involving soft tissue the familiar black eye is an example. Other closed wounds, however, may involve extensive internal bleeding plus severe physical damage to tissues, organs, or systems.

B. Causes

1. Most closed wounds are caused by external forces, such as falls and motor vehicle accidents.

2. Sometimes closed wounds are caused if the victim of a closed fracture is mishandled or is moved before splints are properly applied to immobilize his injuries.

C. Signs and Symptoms

1. General symptoms

Even if no outward signs of injury are obvious, internal injury is possible when any of the following general symptoms are present.

- a. Cold, clammy, pale skin; very rapid but weak pulse; rapid breathing and dizziness.
- b. Pain and tenderness in a part of the body in which injury is suspected, especially if deep pain continues and seems out of proportion to the injury symptoms.
- c. Uncontrolled restlessness and excessive thirst.
- d. Vomited or coughed up blood, or blood in the urine or feces.

As a general rule, suspect a closed wound, with internal bleeding and possible rupture of a body organ, whenever a severe force exerted on the body produces severe shock or unconsciousness.

2. Specific symptoms

- a. Pain
- b. Tenderness

3 . Signs

- a. Swelling
- b. Discoloration
- c. Deformity of limbs, caused by fractures or dislocations.

D. Emergency care

1. Maintain an open airway; give artificial respiration if indicated.
2. Carefully examine the victim for fractures, and other injuries to the head, neck, chest, abdomen, limbs , back, and spine.
3. If an internal injury is suspected, get medical care for the victim as soon as possible.
4. If a closed fracture is suspected, immobilize the affected area before moving the victim.
5. If the victim must be moved, carefully transport him in a lying position; give special attention to preventing shock.
6. Do not give fluids by mouth to a victim suspected of having severe internal injury, no matter how much he complains of thirst.
7. When a relatively small closed wound occurs (such as a black eye) , put cold applications on the injured area to prevent added tissue swelling and to slow down internal bleeding.

Section 6

POISONING

6.1. **LEARNING GOAL:** The student will demonstrate the basic causes, signs, symptoms, and emergency care for all types of poisonings.

PERFORMANCE OBJECTIVE:

6.1.1 The student will define the various types of poison cases.

6.1.2 The student will list in proper sequence the stages of emergency care for poison victims.

6.1.3 The student will list the proper sequence for the care of snake bite, insect, and contact poisons.

RESOURCE MATERIAL:

I. DEFINITION

A poison is any substance solid, liquid, or gas that tends to impair health or cause death when introduced into the body or onto the skin surface.

A. Examples of poisons around the home

Poisonous substances within the home environment are extremely prevalent, and it would be difficult to name all of them. A few typical household poisons are listed below

1. Cosmetics, hair preparation
2. Gasoline, kerosene, and other petroleum products

3. Paint and turpentine
4. Strong detergents
5. Bleaches
6. Cleaning solutions
7. Lye
8. Glue
9. Ammonia
10. Acids
11. Poisonous plants, such as mountain laurel, rhododendron, oleander, a variety of wild cherries, nightshade and foxglove.
12. Nonedible mushrooms

II. CAUSES

- A. Frequent causes (overdose, careless storage, lack of supervision, etc.)
- B. Examples of poisons around home (gas, bleaches, acids)
- C. Ways in which poisoning may occur (by mouth, absorption, inhalation, ingestion) .

III. SIGNS AND SYMPTOMS

Symptoms of poisoning vary greatly. Aids in determining whether or not a victim has swallowed poison include

- A. Information from the victim or from an observer.
- B. Presence from the victim or from an observer.
- C. Condition of the victim (sudden onset of pain or illness)
- D. Burns around the lips or mouth
- E. Odor of a caustic substance on the breath
- F. Pupils of the eyes contracted to pinpoint size from an overdose of morphine or similar drugs.

IV. OBJECTIVES IN TREATMENT OF POISONING BY MOUTH

The objectives in treatment of poisoning by mouth are to dilute the poison as quickly as possible, to seek medical advice from a physician or a poison control center, to maintain respiration or circulation, to preserve vital functions, and to seek medical assistance without delay.

V. FIRST AID

Begin immediately to carry out the above mentioned objectives as quickly as possible.

- A. First aid for conscious victim.
 - 1. Dilute the poison by having the victim drink a glass of water or milk if he is conscious and not having convulsions. Discontinue dilution if it makes him nauseated.

2. Save the label or container of the suspected poison for identification. If the victim vomits, save a sample of the vomited material for analysis.
3. Seek medical assistance by calling the poison control center or a physician. (You should post the poison control center number for your region on your telephone. If you do not have the number, dial 911 or the nearest emergency hospital.
4. If the victim becomes unconscious, keep his airway open. Give artificial respiration or cardiopulmonary resuscitation (CPR) if indicated. Call an emergency squad as soon as possible.
5. Background information

- a. First aid supplies. These supplies should be used only on the advice and instruction of the poison control center or a physician.

All households should have on hand syrup of ipecac, activated charcoal, and epsom salts for dealing with incidents of poisoning by mouth. Syrup of ipecac is used to induce vomiting, activated charcoal is for binding (deactivating) the poisonous substances, and epsom salts work as a laxative.

Recommended dosages are as follows:

Syrup of ipecac one tablespoonful for children and two tablespoonfuls for adults

Activated charcoal one to two tablespoonfuls, mixed in a glass of water

Epsom salts one tablespoonful mixed in a glass of sweet liquid for adults and smaller doses for children

When syrup of ipecac is not available, vomiting may be induced by tickling the back of the victim's throat with a finger or the blunt end of a spoon, fork, or knife.

- b. Do not neutralize. Make no attempt to neutralize swallowed poisons with vinegar or lemon juice. Doing so may cause further harm to the victim. Do not give olive oil or other oils. They are of no proven value in the treatment of poisoning by mouth and may cause harm if inhaled into the lungs.
- c. Delayed medical advice. If the poisoning incident occurs in a situation where a phone is not available (e.g., camping), or if for some other reason a poison control center or a physician cannot be reached, vomiting should be induced as described previously only if (1) the victim has ingested an overdose of drugs or medications or (2) it is certain that the substance was not a strong acid, strong alkali, or petroleum product. The victim should be taken to a medical facility as soon as possible.

d. Recognition of strong acids, alkalis, or petroleum products.

Burns around the victim's lips or mouth, or a characteristic odor of kerosene or gasoline, indicate that strong acids, alkalis, or petroleum products have been swallowed. Many liquid toilet bowl cleaners are strong acids. Drain cleaners, oven cleaners, and lye are examples of strong alkalis.

e. Special considerations for strong alkalis. When liquid

caustics, particularly strong alkalis, have been swallowed, the value of diluting is questionable. Tissue damage in the mouth and throat is immediate (within 30 seconds) and progressive. In such situations, dilution may not be of real value, and there is danger of stimulating the victim to vomit, thereby causing more tissue damage.

f. Instructions on labels. The instructions on product labels for the specific treatment of poisoning caused by the product may be wrong. Specific antidotes should be administered only on the advice of the poison control center or a physician.

g. Special consideration for petroleum products. Certain

petroleum products contain heavy metals, pesticides, or chlorinated solvents that are very toxic if absorbed into the bloodstream. When such products are swallowed, a physician may suggest the induction of vomiting. However, vomiting should not be induced except on the advice of a poison control center or a physician.

B. First aid for an unconscious victim

1. Maintain an open airway.
2. Call for an emergency squad as soon as possible.
3. Administer artificial respiration and CPR, if indicated.
4. Save the container of a suspected poison.
5. If the patient has vomited, save a sample of vomited material.
6. Do not give fluids to an unconscious person.
7. Do not induce vomiting in an unconscious person. If the victim is vomiting, position him and turn his head so that the material drains out of the mouth.

C. Victim having Convulsions

1. If victim is convulsing, do not give medication and do not induce vomiting.
2. After convulsions, turn victim on side or face down with head to side.
3. Induce vomiting by tickling back of throat or by giving nauseating fluid.
4. When victim vomits, position him on side or stomach.
5. Do not induce vomiting if victim has swallowed strong acid of alkali or petroleum product, because additional damage may be caused.

6. Look for key signs that tell when not to induce vomiting (breath odor, burns about mouth, etc.) .

7. If victim is unconscious, convulsing, or exhausted, do not give fluids or induce vomiting.

D. Inhaled poisonous gases

Carbon monoxide, the most common poisonous gas formed from incomplete burning of fuel, is particularly treacherous because it is completely odorless. The victim may lose consciousness and be asphyxiated, with no prior warning symptoms other than slight dizziness, headache, and weakness. The victim's lips and skin may have a characteristically red color. Death may occur within a few minutes. Prompt action is necessary.

1. If the victim is in a closed room, garage, or other small space, take a deep breath and hold it before entering. If possible, the victim should be removed to a source of fresh air, or fresh air should be let into the area in which the victim was found. An emergency squad should be called immediately and should be told that oxygen may be needed. It is important to maintain an open airway and to give artificial respiration or CPR, if indicated.

2. Loose tight clothing.
3. Seek medical assistance as quickly as possible. Indicate the nature of the problem and that oxygen should be brought to the scene.

VI. CONTACT POISONS

A. Chemical burns

Harsh chemicals and corrosive poisons if spilled on the skin produce chemical burns, which require immediate first aid.

B. Contact with poisonous plants.

1. Characteristic reactions

The majority of skin reactions following contact with offending plants are allergic in nature and are characterized by:

- a. General symptoms of headache and fever
- b. Itching
- c. Redness
- d. A rash

Some of the most common and most allergic reactions result from contact with plants of the poison ivy group, including poison oak and poison sumac. Such plants produce severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim also may develop a high fever and may be very ill.

Ordinarily, the rash begins within a few hours after exposure, but it may be delayed for 24 to 48 hours.

2. Distinguishing features of poison ivy group plants. The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. Both plants also have greenish white flowers and berries that grow in clusters.

3. First aid

- a. Remove contaminated clothing; wash all exposed area thoroughly with soap and water, followed by rubbing alcohol.
- b. Apply calamine or other soothing skin lotion if the rash is mild.
- c. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.

C. First aid for contact poisons

1. Remove the contaminated clothing; immediately drench and flush the affected skin with large quantities of water or special neutralizing agents if they are available as you remove clothing.
2. If poisoning is from a pesticide or a corrosive substance (strong acid or alkali), send for an ambulance immediately.

VII. PREVENTION

- A. Prevention of poisoning from drugs and chemicals.
- B. Prevention of poisoning from plants.

VIII. POISONING BY MARINE LIFE

Briefly discuss or give test for knowledge.

- A. Causes and effects
- B. Ingestion of poisonous shellfish and fish.
- C. Stings

IX. POISONOUS INSECT BITES

- A. Kind and effects

1. Stings from ants, bees, wasps, hornets, and yellow jackets occasionally cause death. Death from the sting of such creatures is almost due to acute allergic reaction.
2. Bites or stings from fleas, mosquitoes, lice, gnats, chiggers, and other common insects produce local pain and irritation but are not likely to cause severe reactions. Some of these insects may transmit disease to man but are not poisonous in themselves.
3. Ticks can transmit germs to several diseases, including Rocky Mountain spotted fever, a disease that occurs in the eastern portion of the United States as well as the western portion. Ticks adhere genaciously to the skin or scalp. There is some evidence

that the longer an infected tick remains attached, the greater is the chance that it will transmit disease.

4. Spiders in the United States are generally harmless, with two notable exceptions: the black widow spider *Latrodectus mactans* and the brown recluse (*Loxosceles reclusa*), or violin spider.

a. Symptoms resulting from the black widow spider bite:

- (1) Slight local reaction
- (2) Severe pain produced by nerve toxin
- (3) Profuse sweating
- (4) Nausea
- (5) Painful cramps of abdominal muscles
- (6) Difficulty in breathing and speaking (Victims in almost all cases recover, but an occasional death is reported)

b. Symptoms resulting from the brown recluse spider bite:

- (1) Severe local reaction produced by venom, which forms an open ulcer within 1 to 2 weeks
- (2) Destruction of red cells and other blood changes
- (3) Development of chills, fever, joint pains, nausea and vomiting.
- (4) Possible development of generalized rash within 24 to 48 hours.

5. Tarantulas, identified as hairy spiders, do not ordinarily produce generalized reactions but may be responsible for a severe local wound. They are commonly found in bananas and fruit shipped from South and Central America.

6. Scorpions

Scorpions inject venom through a stinger in the tail.

a. Effects

In bites from the more dangerous species, there are marked systemic effects within 1 to 2 hours. Fatalities have been recorded.

b . Symptoms

- (1) Excruciating pain at the site of the sting
- (2) Nausea and vomiting
- (3) Abdominal pain
- (4) Shock
- (5) Possible development of convulsions and coma.

B. First Aid

1. Minor bites and stings

a. Cold applications

b. Soothing lotions, such as calamine

2. Tick bites

- a. Cover the tick with heavy oil (mineral, salad, or machine) to close its breathing pores. The tick may disengage at once; if not, allow the oil to remain in place for a half hour. Then carefully remove the tick with tweezers, taking care that all parts are removed.
- b. With soap and water, thoroughly but gently scrub the area from which the tick has been removed, because disease germs may be present on the skin. (Although use of tweezers for removal of a tick and application of heat to the tick's body, as by a lighted cigarette, often have been attempted, these methods may leave tick parts in the wound or may injure the skin) .

3. Severe reaction

- a. Give artificial respiration if indicated.
- b. Apply a constricting band above the injection site on the victim's arm or leg (between the site and heart) . Do not apply tightly. You should be able to slip your index finger under the band when it is in place.
- c. Keep the affected part down, below the level of the victim's heart.
- d. If medical care is readily available, leave the band in place; otherwise, remove it after 30 minutes.

- e. Apply ice contained in a towel or plastic bag, or cold cloths, to the site of the sting or bite.
- f. Give home medicine, such as aspirin, for pain.
- g. If the victim has a history of allergic reaction to insect bites or is subject to attacks of hay fever or asthma, or if he is not promptly relieved of symptoms, call a physician or take the victim immediately to the nearest location where medical treatment is available. In a highly sensitive person, do not wait for symptoms to appear, since delay can be fatal.
- h. In case of a bee sting, remove and discard the stinging apparatus and venom sac.

X. POISONOUS SNAKEBITES

A. Kind and effects

1. Kinds of poisonous snakes.

a. Rattlesnakes - 13 species

The six most common species listed are

- (1) Timber
- (2) Eastern Diamondback
- (3) Western Diamondback
- (4) Pacific

(5) Prairie

(6) Massauga

b. Copperheads

c. Water moccasins

d. Coral snakes

Rattlesnakes, copperheads, and water moccasins belong to the family of pit vipers (Crotalinae). These snakes have a pit between the eye and the nostril on each side of the head, elliptical pupils, from one to six fangs but usually two well developed fangs, and one row of plates beneath the tail. The venom of these snakes affects the circulatory system. The coral snake is a member of the cobra family and is found along the coast and lowlands of the southeastern United States and in the southwestern portions. The coral snake is small, has tubular fangs, and may have teeth behind the fangs. It has some features of nonpoisonous snakes; round pupils and a double row of plates beneath the tail. It is characterized by red, yellow, and black rings around the body, with the red and yellow rings adjoining, and always has a black nose. The potent venom of the coral snake affects the nervous system and is very toxic.

Nonpoisonous snakes have round pupils, no fangs or pits, and a double row of plates beneath the tail.

All reactions from snakebite are aggravated by acute fear and anxiety.

2. Effects of poisonous snakebites

Factors that affect the severity of local and general reaction from poisoning snakebite include the following:

- a. The amount of venom injected and the speed of absorption of venom into the victim's circulation.
- b. The size of the victim.
- c. Protection from clothing, including shoes and gloves.
- d. Specific anti venom therapy, as soon as possible.
- e. Location of the site.

B. Signs and symptoms

1. Pit viper bite

a. Characteristics

- (1) Extremely painful
- (2) Characterized by rapid swelling
- (3) Identified by one or more puncture wounds created by the fangs.
- (4) Usually marked with general discoloration of the skin.

b. Manifestations

General weakness, rapid pulse, nausea and vomiting,
shortness of breath, dimness of vision and shock.

2. Coral snake bite manifestations:

Only slight burning pain and mild local swelling at the wound;
blurred vision, drooping eyelids, slurred speech, drowsiness,
increased saliva and sweating, perhaps nausea and vomiting
shock, respiratory difficulty, paralysis, convulsions, and possible
development of coma.

C. Objectives of first aid

1. To reduce the circulation of blood through the bite area.
2. To delay absorption of venom
3. To prevent aggravation of the local wound and to sustain respiration.

D. First aid procedure

The most important step is to get the snakebite victim to the hospital quickly. Meanwhile, take the following first aid measures:

1. Keep the victim from moving around.
2. Keep the victim as calm as possible and preferably in a lying position.

3. Immobilize the bitten extremity and keep it at or below heart level.

If the victim can reach a hospital within 4 to 5 hours and if no symptoms develop, no further first aid measures need be applied.

4. If mild to moderate symptoms develop, apply a constricting band 2 to 4 inches above the bite, but not around a joint the elbow, knee, wrist, or ankle and not around the head, neck, or trunk. The band should be $\frac{3}{4}$ inches to 1 inch wide, not thin like a rubber band. The band should be snug but loose enough for a finger to be slipped underneath. Watch out for swelling. Loosen the band if it becomes too tight, but do not remove it. Periodically check the pulse in the extremity beyond the bite to insure that the blood flow has not stopped.

5. If severe symptoms develop, make an incision and apply suction immediately. Apply a constricting band, if that has not already been done, and make a cut in the skin through the fang mark(s). Use a sharp, sterilized knife. Cuts should be no deeper than just through the skin and should be $\frac{1}{2}$ inch long, extending over the suspected venom deposit point. (Because a snake strikes downward, the deposit point is usually lower than the fang mark.) Cuts should be made along the long axis of the limb. Do not make cross-cut incisions. Do not make cuts on the head, neck, or trunk. Apply suction with a suction cup for 30 minutes. If a suction cup is not available, use the mouth. There is little risk to the

rescuer who uses his mouth, but it is recommended that the venom not be swallowed and that the mouth be rinsed out.

If the hospital is not close, that is, if it cannot be reached in 4 or 5 hours, take the following :

Keep trying to obtain professional care, either by transporting the victim to a place where medical care is available or by using an emergency communications system to obtain medical advice.

If no symptoms develop, keep trying to reach the hospital and give the general first aid described above in steps 1, 2, and 3.

If any symptoms at all develop, apply a constricting band, make incisions, and apply suction immediately, as described above in steps 4 and 5.

Several other factors must be considered in cases of snakebite:

Shock. Keep the victim lying down and comfortable, maintain his body temperature.

Breathing and heartbeat. If breathing stops, give mouth to mouth resuscitation. If breathing stops and there is no pulse, perform cardiopulmonary resuscitation (CPR) if you have been trained to do so.

Identify the snake. If you can kill the snake without risk or delay, bring it to the hospital for identification, but exercise extreme caution in handling the snake.

Cleaning the bitten area. You may wash the bitten area with soap and water and blot it dry with sterile gauze. You may apply dressings and bandages, but only for a short period of time.

Medicine to relieve pain. Do not give the victim alcohol, sedatives, aspirin, or any medicine containing aspirin. Some painkillers, however, may be given. Consult a doctor or other medical personnel for specific medications that may be used. Snakebite kits. Keep a kit accessible for all outings in primitive areas or areas known or suspected to be snake infested.

It is not recommended that cold compresses, ice, dry ice, chemical ice packs, spray refrigerators, or other methods of cold therapy be used in the first aid treatment of snakebite.

E. Prevention of Snakebite

Approximately 45,000 snakebite incidents occur each year in the United States. Venomous, or poisonous, snakebites account for 20 percent of that total. Although mortality is low, the high incidence of crippling injuries to the bitten extremity (mostly by pit vipers rattlesnakes, water moccasins, and copper heads) is of great

concern. More than half the cases of venomous snakebite take place in Texas, North Carolina, Florida, Georgia, Louisiana, and Arkansas.

XI. PREVENTION OF ACCIDENTAL POISONINGS

A. Specific prevention of accident poisonings

1. Proper storage
2. Proper use
3. Disposal technique
4. Identification and recognition
5. Know signs and symptoms
6. Know proper First Aid action phase.

Section 7

SPECIFIC INJURIES

7.1 LEARNING GOAL: The student will possess the basic knowledge

PERFORMANCE OBJECTIVE:

7.1.1 The student will list the basic signs and symptoms for the following specific injuries:

- (1) Eye injuries
- (2) Head injuries
- (3) Neck injuries
- (4) Sucking chest wounds
- (5) Chest injuries
- (6) Penetrating wounds of the chest
- (7) Abdominal injuries
- (8) Back injuries
- (9) Extremity injuries

RESOURCE MATERIAL:

I. EYE INJURIES

Foreign objects are often blown or rubbed into the eyes. Such objects are harmful not only because of the irritating effect but

also because of the danger of their scratching the surface or becoming embedded in the eye.

A. Symptoms

1. Redness of eyes
2. Burning sensation
3. Pain
4. Headache
5. Overproduction of tears

B. Precautions

1. Keep the victim from rubbing his eye.
2. Wash your hands thoroughly before examining the victim's eye.
3. Do not attempt to remove a foreign object by inserting a match, toothpick, or any other instrument.
4. Refer the victim to a physician if something is embedded in the eye, or if something is thought to be embedded but cannot be located.

C. Removal of a foreign body from the surface of the eyeball or from the inner surface of the eyelid.

1. Pull down the lower lid to determine whether or not the object lies on the inner surface.

2. If the object lies on the inner surface, lift it gently with the corner of a clean handkerchief or paper tissue. Never use dry cotton around the eye.
3. If the object has not been located, it may be lodged beneath the upper lid.
 - a. While the victim looks down, grasp the lashes of the upper lid gently.
 - b. Pull the upper lid forward and down over the lower lid. Tears may dislodge the foreign object.
 - c. If the foreign object has not been dislodged, depress the victim's upper lid with a matchstick or similar object placed horizontally on the top of the cartilage and invert the lid, by pulling upward on the lashes against the matchstick. Lift off the foreign object with the corner of a clean handkerchief and replace the lid by pulling downward gently on the lashes.
 - d. Flush the eye with water.
 - e. If the object is still not removed and is suspected to be embedded, apply a dry, protective dressing and consult a physician.

D. Injuries

1. Injury of the eyelid

First aid in injury of the eyelid as follows:

- a. Stop hemorrhage by gently applying direct pressure.
 - b. Cleanse the wound and apply a sterile or clean dressing, which can be taped in place or held snugly by a bandage that encircles the head. Seek medical care without delay.
 - c. Bruises above and below the eye, involving rupture of small blood vessels, should be treated by immediate cold applications to lessen bleeding and swelling.
2. Blunt injury or contusion
- a. A contusion occurs from a direct blow, as from a fist, a vehicle accident, or an explosion. The most common result is a black eye.
 - b. In serious cases, the structure of the eye may be torn or ruptured.
 - c. Secondary damage may be produced by the effects of hemorrhage, and later by infection.
 - d. Vision may be lost.
 - e. Bleeding may recur after several days.
 - f. Any person experiencing a blunt injury of the eye should be seen by a physician, preferably an eye specialist, as soon as possible.
 - g. A dry sterile or clean dressing should be applied, and the victim should be transported lying flat.

3. Penetrating injuries of the eye

Penetrating injuries of the eye are extremely serious and can result in blindness. First aid is as follows:

- a. Make no attempt to remove the object or to wash the eye.
- b. cover both eyes loosely with a sterile or clean dressing, secured with tape or a bandage that encircles the victim's head but loose enough to avoid pressure on the eyes.
Coverage of both eyes is necessary to eliminate movement of the affected eye.
- c. Keep the victim quiet, preferably on his back.
- d. Transport the victim by stretcher.
- e. Telephone ahead to an eye specialist, or take the victim to the nearest appropriate hospital emergency room. The sooner he receives medical care, the greater the chances of saving his sight.

II. HEAD INJURIES

A. Scalp injuries

1. Characteristics

Wounds of the scalp, even if small, tend to bleed profusely. A severe wound may be concealed by thick hair and therefore be overlooked. Deep scalp wounds may be complicated by

fragments from skull fractures, or they may contain hair, glass, or other foreign matter.

2. First aid

- a. Do not attempt to cleanse scalp wounds of contaminants; to do so may cause serious bleeding and, if the skull is fractured, can lead to contamination of the brain.
- b. Control bleeding by raising the victim's head and shoulders, if possible; but do not bend the neck, since a fracture may be present.
- c. Place a sterile dressing snugly on the wound. Excessive pressure should not be used, however, because the bone may be fractured.
- d. When bleeding is under control, apply a bandage to hold the dressing in place and to provide continuing pressure.

B. Brain Injuries

Brain injury may be a factor not only in wounds of the scalp and open or closed fractures of the skull but also in the case of an illness such as a stroke or a tumor.

1. Symptoms

- a. Clear or blood tinged cerebrospinal fluid draining from the nose or ears following a skull fracture.

b. Temporary loss of consciousness (If a person with a head injury loses consciousness later, his condition is probably serious because of progressive swelling of the brain or a hemorrhage within the skull.)

c. Other manifestations of brain injury.

- (1) Partial or complete paralysis of muscles of the opposite side, and the muscles of the face on the same side as the side of the brain injury
- (2) Disturbance of speech
- (3) Convulsions, general or local, indicated by persistent twitching of muscles.
- (4) Bleeding from the nose, ear canal, or mouth, which reflects possible head injury with a fracture
- (5) A pale or flushed face
- (6) Pulse, although slow and full initially, becoming fast and weak
- (7) Headache, sometimes associated with dizziness
- (8) Vomiting
- (9) Pupils of the eyes unequal in size
- (10) Loss of bowel and bladder control

2. First aid for suspected brain injury

- a. Obtain medical assistance as quickly as possible. Call for an ambulance equipped with oxygen.
- b. Keep the victim lying down. Treat for shock and if there is no evidence of neck injury and the victim is unconscious, place a small pillow or a pillow substitute (for example, a rolled-up blanket or overcoat) under his shoulders and head. Do not place the pillow only under victim's head, because doing so might result in head flexion with consequent airway obstruction. Turn his head toward the side so that secretions may drool from the corner of his mouth. Never position the victim so that his head is lower than the rest of his body. Remove the pillow if artificial respiration is to be used.
- c. Give particular attention to ensuring an open airway. Administer artificial respiration when necessary.
- d. Control hemorrhage.
- e. Do not give the victim fluids by mouth.
- f. If a scalp wound is present, apply a large dressing over the injury and bandage it in place with a full head bandage.
- g. Record the extent and duration of unconsciousness.

C. Face and jaw injuries

1. Causes

Wound and fractures of the face and of the upper or lower jaw often occur in victims of automobile accidents or other types of violent injury.

2. First aid

The principal immediate problems are obstruction of the air passage by blood, saliva, and other secretions; and swelling and severe hemorrhage.

- a. Have someone call for an ambulance or medical assistance as quickly as possible.
- b. Continuously maintain an open airway. Remove any dentures, broken teeth, or other foreign matter.
- c. Provide continuous support of the victim's head and jaw to prevent airway obstruction by the tongue.
- d. If the victim is conscious and neck injury is not suspected, prop him up so that he is leaning forward to let secretions drain out spontaneously or when he coughs. If the facial injuries are extensive, the victim should be assumed to have a cervical spine fracture until X rays prove otherwise.

- e. If the victim is unconscious, elevate his head and shoulders slightly (unless neck fracture is suspected) and turn his head to the side to allow blood and saliva to drain out, or place him on his side or abdomen for drainage.
- f. Apply artificial respiration if necessary.

NOTE. Jaw fractures and injuries that cause bleeding from the mouth or nose create special problems if artificial respiration is given. Proper positioning and the gentle removal of foreign material or of blood clots may help to ensure an open airway, but the injuries may be such that it is difficult or impossible to administer mouth-to-mouth or mouth-to-nose artificial respiration.

- g. Treat for shock.
- h. Apply protective dressings as necessary.

D. Ear Injuries

1. Cuts and lacerations

Cuts and lacerations of the ear occur frequently. Any torn and detached part of the ear should be saved and should accompany the victim to a medical facility. First aid is as follows:

- a. Apply a dressing with light, even pressure.
- b. Raise the victim's head.

2. Perforation

a. Causes

Perforation (rupture) of the eardrum may result from a blast, a blow on the head, diving, a sudden change in atmospheric pressure, or a disease of the middle ear.

b. First aid

- (1) Place a small pledget of gauze or cotton loosely in the outer ear canal for protection.
- (2) Obtain medical care.
- (3) Do not allow the victim to hit himself on the side of his head in an effort to restore hearing.
- (4) Do not insert instruments or any kind of liquid into the ear canal.

3. Perforation of the eardrum associated with skull fracture

a. Precaution

Perforation of eardrum associated with skull fracture requires special attention.

b. First aid

- (1) Do not clear the ear.
- (2) Do not stop the flow of cerebrospinal fluid from the ear.

- (3) Turn the victim onto his injured side (unless there is some reason not to do so), with his head and shoulders propped up on a small pillow to allow fluid to drain away.

E. Nose Injuries and nosebleeds

1. Characteristics and causes

Injury to the soft tissue of the nose may or may not include fractures. Nosebleeds can result from injury or disease (such as high blood pressure, which can cause profuse, prolonged and dangerous bleeding). Nosebleed may also occur after a cold, a period of strenuous activity, or exposure to high altitudes.

Nosebleeds are generally more annoying than serious. Walking, talking, laughing, blowing the nose, or otherwise disturbing clots may cause increase or resumption of bleeding.

2. First aid

- a. Keep the victim quiet.
- b. Place the victim in a sitting position, leaning forward if possible; if that is not possible, place him in a reclining position with the head and shoulders raised.
- c. Apply pressure directly at the site of the bleeding by pressing nostril toward the midline.
- d. Apply cold compresses to the victim's nose and face.

- e. If bleeding cannot be controlled by the preceding measures, insert a small, clean pad of gauze (not absorbent cotton) into one or both nostrils and apply pressure externally with your thumb and index finger. A free end of the pad must extend outside the nostril so that the pad can be removed later.
- f. If bleeding continues, obtain medical assistance.
- g. Do not use first aid measures against the injury itself except, perhaps, a dressing.
- h. Make sure that nasal bone fractures, like all other fractures, have medical attention.

III. NECK INJURIES

A. Blockage of the airway

Blunt force exerted on the face, mouth, or jaw may produce so much tissue damage that body fluids draining into the air passages block the airway. The airway may also be blocked as a result of a hard blow on the front of the neck, especially if the larynx area is affected and throat tissues are bruised so badly that extensive swelling results. In such cases, if necessary, do the following:

1. Apply mouth to mouth or mouth to nose artificial respiration.

2. Obtain immediate medical assistance, in case an emergency tracheostomy (an opening into the trachea) is needed.

B. Lacerations or puncture wounds.

Lacerations or puncture wounds of the neck may involve the jugular veins, which are on the sides of the neck just beneath the skin, or the deeper major arteries and veins. Bleeding from neck wounds is dangerous and difficult to control. Control bleeding by the following measures:

1. Exert direct pressure over the wound.
 2. Keep the victim's head and shoulders raised and his airway open.
 3. Do not remove pressure until the victim is seen by a physician.
 4. Seek medical attention without delay.
 5. If bleeding is not a problem, cover wound with a dressing held in place with tape.
 6. Never apply a circular bandage around the neck.

IV. WOUNDS OF THE CHEST

A. Sucking wound of the chest

1. Description and precautions

A sucking wound of the chest is a deep, open wound of the chest wall through which air can flow in and out with breathing. If the wounding object or instrument is still in place, leave it undisturbed; removing it may result in fatal bleeding. The victim should be taken as quickly as possible to the nearest hospital. The hospital staff should be alerted in advance, if possible, and be told the nature of the emergency.

2. First aid

- a. To prevent air from entering the cavity, cover the open wound by placing a large pad over the open wound. The pad may be made from sterile gauze, a cloth as clean as possible, plastic, or metal foil. The pad should form an airtight seal and should be held in place with tape, a belt or a bandage. Be careful, however, not to apply the binding so tightly that breathing is restricted.
- b. If necessary, the palm of the hand may be applied until a suitable bandage can be obtained.
- c. Maintain an open airway and give artificial respiration if required.
- d. Transport the victim with his injured side down.

B. Penetrating wounds of the heart or the large blood vessel of the chest

1. Precautions

If the victim has been injured by an object or instrument that penetrates the body and remains there, the penetrating object should be left undisturbed and immobilized in place with dressings and tape if possible.

2. First aid

- a. Elevate the victim's head.
- b. Give artificial respiration if necessary.
- c. Take the victim as quickly as possible to the nearest hospital. The staff should be alerted in advance and told of the nature of the emergency.

C. Compression of lung tissue

1. Causes and precautions

A lung may be compressed by blood or other fluids, or by air that has escaped into the chest cavity from air passages through a tear in the surface of the lung. This is an emergency that requires immediate medical attention, but until medical attention is available, any person with difficulty in breathing, should have first aid, as described below.

2. First aid

- a. Position the victim for mouth-to-mouth artificial respiration. Maintain an open airway.

- b. Give artificial respiration if necessary.
- c. Seek medical help as quickly as possible.

D. Crushing injuries of the chest

1. Causes and characteristics

Crushing injuries of the chest are commonly found in victims of vehicle accidents, when the driver comes in contact with the steering wheel, for example. Crushing injuries of the chest with multiple rib fractures tend to restrict breathing because of extreme pain, thus reducing the volume of air reaching the lungs.

2. First aid

First Aid measures include placing the victim in a comfortable position. If fractures are on one side, place the victim on the injured side, if possible. If a bandage is required for an open wound, apply it carefully, so as not to interfere with breathing. Elevation of the victim's head and shoulders may reduce his difficulty in breathing.

V. ABDOMINAL INJURIES

A. Precaution

Wounds of the abdomen are particularly dangerous because of the risk of damage to internal organs.

B. First aid

1. Wounds deep in the abdomen

- a. Place the victim at rest on his back (supine position with a pillow under the knees to help relax the abdominal muscles.
- b. Control bleeding.
- c. Give first aid for shock.

2. Open wounds of the abdomen

- a. Do not try to replace protruding intestines or abdominal organs but cover them with a sterile dressing, a clean towel, plastic, or metal foil. Dampen the dressing if there is delay in obtaining medical assistance; use sterile water or cool, boiled water, if available.
- b. Hold the dressing in place with a firm bandage, but do not apply the bandage so tightly as to cause constriction.
- c. Do not give fluids or solid food, because surgery will be necessary.
- d. If breathing is difficult, keep the victim's head and shoulders elevated with a pillow or a folded coat.
- e. Summon medical attention as rapidly as possible and take extreme care to gently transport the victim.

VI. BACK INJURIES

In any accident involving the back, injury to the spinal cord should be considered. Careful handling of the victim is extremely important. Do not bend the back during transportation. If the victim requires artificial respiration, it should begin in the position in which he is lying. A person who has been injured in the water should not have his head bent forward, nor should he be placed in a jackknife position. The victim should be floated to shore carefully and should be taken from the water only when a rigid support is available. Preferably, the victim should not be moved until an ambulance arrives with a special stretcher and trained personnel.

VII. INJURIES TO THE GENITAL ORGANS

A. Causes and characteristics

Injuries to the genital organs may result from kicks, blows, straddle accidents, accidents involving machinery, and occasionally blows from sharp instruments. Such injuries are accompanied by great pain, marked swelling, and considerable bleeding.

B. First aid

1. Save any torn tissue for possible skin grafting.
2. Control bleeding by direct pressure with the hand on a pad of cloth.

3. Give first aid for shock, if appropriate.
4. Provide protective and supportive dressings for open wounds.
5. Apply cold packs, if available.
6. Provide bed rest.

VIII. INJURIES TO LEGS AND FEET

A. Precautions and characteristics

Serious wounds of the legs and feet are obviously incapacitating, but the importance of small wounds of the lower legs and feet is frequently overlooked. In older persons, small wounds may take a long time to heal because of poor circulation.

B. First aid

Such injuries should receive medical attention, but if medical treatment is delayed

1. Cover wounds of the legs and feet and wrap them with supportive not constrictive bandages if available.
2. Keep an injured limb elevated with pillows or a rolled-up coat.
3. Do not allow the victim with a leg or foot wound to walk.

- 4 . Remove shoes and hose and examine color of the toes from time to time. If toes become blue or swollen, loosen the bandages but do not remove dressings.

IX. HAND INJURIES - FIRST AID

- A. The most important first aid for a hand injury is elevation above the level of the heart, in order to reduce further swelling of tissues caused by gravity. (Only after snakebite and stings should the hand be kept hanging down after injury.)
- B. If the wound is at all serious, do not try to cleanse it.
- C. Apply pressure over a sterile or clean pad to control bleeding; place a roll of bandage or cloth, fluffed up gauze squares, or other material into the palm of the victim's hand and curve his fingers around it.
- D. Separate the fingers by gauze or cloth dressing material and cover the entire hand with a sterile towel, a clean cloth, or an unused plastic bag.
- E. Elevate the victim's hand in a sling or on pillows during transportation to receive medical care.

X. BLISTERS - FIRST AID

- A. Blisters caused by friction from shoes or boots appear on the heels, toes, and tops of feet. If all pressure can be relieved until the fluid is absorbed, blisters are best left unbroken. Otherwise,

wash the entire area with soap and water and make a small puncture hole at the base of the blister with a needle that has been sterilized in a match flame or by soaking in rubbing alcohol.

B. Apply a sterile dressing and protect the area from further irritation.

C. If the blister has already broken, treat it as an open wound.
Watch for signs of infection.

D. Self care for blisters should not be attempted when the blister fluid lies deep in the palm of the hand or sole of the foot.

Section 8

DRUGS AND THEIR ABUSE

8.1 LEARNING GOAL: The student will be familiar with basic definitions of drugs, drug misuse, drug abuse, and drug dependence.

PERFORMANCE OBJECTIVES:

8.1.1 The student will be able to verbally or in writing define; drugs, drug abuse, drug misuse, and drug dependence.

8.2 LEARNING GOAL: The student will know, the basic symptoms of drug abuse.

8.2.1 The student will identify basic symptoms of drug abuse.

8.3 LEARNING GOAL: The student will develop the skill to identify the characteristics, types, effects, abuse and first aid for drugs.

PERFORMANCE OBJECTIVE:

8.3.1 The student will list the definition, effects, and first aid for the following drug classifications:

- | | |
|-------------------|-------------------|
| (1) Alcohol | (5) Inhalants |
| (2) Cannabis | (6) Narcotics |
| (3) Depressants | (7) Stimulants |
| (4) Hallucinogens | (8) Tranquilizers |

RESOURCE MATERIAL:

Administered under medical direction, drugs often appear to have miraculous effect in relieving suffering, combating disease, and saving life. When the same drugs are misused or abused, they can become enemies.

I. DEFINITIONS

A. Drug

A drug is a substance that affects the functions of the body or mind when taken into the body or applied to its surface. Some drugs are readily available and are sold over the counter as home remedies. Most drugs, however, are subject to some control or regulation for the protection of health and the promotion of well being. These drugs are available only on a physician's prescription and are intended to be administered only under the direction of the physician. Such use of drugs constitutes accepted medical practice. Note that the word drug is defined broadly here and is not synonymous with the word medication. Abuse of some substances that are not used in medical practice but are drugs by definition may be particularly wide spread and hazardous.

B. Drug misuse

Drug misuse is the use of drugs for purposes or conditions for which they are unsuited or for appropriate purposes but in improper dosage.

C. Drug abuse

Drug abuse is the excessive or persistent use of a drug without regard to accepted medical practice.

D. Drug dependence

Drug dependence is the condition that results from drug abuse. It is described as the interaction between the drug and the body when this interaction involves an effect on the central nervous system. It is characterized by a behavioral response that always includes a compulsive desire to continue taking the drug, either to experience its effects or to avoid the discomfort of its absence. Dependence always involves psychic craving (psychic dependence) and sometimes involves physical, organic disturbance (physical dependence).

II. IDENTIFICATION OF DRUG ABUSE

Almost any drug can be misused or abused. Some drugs are commonly abused, constituting personal and public health problems, with social economic, and legal implications.

In cases of drug abuse emergency, it is important that the signs and symptoms of the abuse are identified by the person providing the immediate assistance. The type and amount of substance used and the time it was taken should be determined, if possible. When the drugs have been taken by mouth and if the individual is seen at the time of oral ingestion or within a few minutes afterward, an effort to empty the stomach to prevent absorption is recommended.

It is sometimes difficult to distinguish between types of drugs taken merely by observing symptoms. This difficulty is increased when drugs are used in combination. The necessary clues to identification are often provided by apparatus, such as teaspoons, paper packs, eye-droppers, hypodermic needles, vials, or collapsible tubes. The presence of gelatin capsules, pills, or other drug containers, or of needle marks on a victim's body is also significant and should be noted.

Information on the types of drugs taken, plus information on the age and size of the victim and his general condition and behavior, should be provided to the drug abuse center or the attending physician.

III. CLASSIFICATION OF DRUGS

Drugs that are abused can be classified in many ways. Some of the groups overlap in one or more effect. The following list is arranged for convenience, without regard to importance, severity, or prevalence of abuse:

Alcohol (alcoholic beverages)

Cannabis (marijuana)

Depressants (sedatives hypnotics)

Hallucinogens

Inhalants

Narcotics

Stimulants

Tranquilizers

A. Alcohol

In this context, the term alcohol refers to alcoholic beverages, whose effects relate to their alcoholic content and to the level of alcohol in the blood resulting from their use. The use of alcohol is legal and widely accepted socially in the United States and in many other countries. In spite of this acceptance, prolonged abuse and consumption of large amounts of alcohol may cause great social and economic detriment, as well as physical damage to individual users. Even a moderate amount of alcohol in combination with a barbiturate or minor tranquilizer may be hazardous.

1. Effects

Alcohol is a depressant, affecting first the higher reasoning areas of the brain, with perhaps a feeling of relaxation or, in the company of others, a sense of exhilaration and conviviality due to the release of inhibitions. Later, motor activity, motor skills, and coordination are disrupted and, with deepening intoxication, other bodily processes are disturbed. In the most severe stages of alcoholic intoxication, superficial blood vessels are dilated, causing a feeling of warmth, even though the actual effect is an increased loss of body heat. Respiration decreases, consciousness wanes, and coma or death may result.

2. Abuse

The drinker may use alcohol as a psychological "crutch." Thus, he may develop a psychic, and later a physical, dependence similar to that produced by the barbiturates.

There is a well defined alcohol abstinence syndrome closely related to that described for the barbiturates. Delirium tremens is a major symptom complex of alcohol withdrawal.

The odor of alcohol on a person's breath does not necessarily indicate intoxication. In addition to the noting of information on incoordination, disturbance of speech, and altered respiration, other means are commonly used to determine whether the level of alcohol in the body equals or exceeds that of legally defined intoxication.

The drinker is often unaware of detriment to his normal skills and should be restrained from activity requiring such skills, particularly driving.

3. First aid

Alcohol intoxication, whether due to an acute overdose or to prolonged abuse, is treated as follows:

- a. If the person is sleeping quietly, his face is of normal color, his breathing is normal, and his pulse is regular, no immediate first aid is necessary.

- b. If the person shows such signs of shock as cold and clammy skin, rapid and thready pulse, and abnormal breathing, or if he does not respond at all, obtain medical aid immediately.
- c. Maintain an open airway, give artificial respiration if indicated, and maintain body heat.
- d. If the victim is unconscious, place him in the coma position so that secretions may drool from his mouth. This position will usually allow for good respiration.
- e. Remember that an intoxicated person may be violent and obstreperous and will need careful handling to prevent him from harming himself and others.

The alcoholic should be encouraged to seek help from Alcoholics Anonymous or from a drug abuse treatment center.

B. Cannabis (marijuana)

Cannabis sativa is an herbaceous annual plant that grows wild in temperate climates in many parts of the world. The various forms of the drug are frequently referred to as cannabis, although the official definition states that cannabis is "the flowering or fruiting tops of the cannabis plant from which the resin has not been extracted."

Marijuana usually consists of crushed cannabis leaves and flowers, and often twigs. It varies greatly in the content of active material.

Hashish is a preparation of cannabis resin, which is squeezed or scraped from the plant top and is generally five or more times as potent as marijuana. Marijuana is smoked; hashish may be smoked but is also commonly made into a confection or beverage.

1. Effects

The use of cannabis in medical practice is not presently recognized. The effects to be described, therefore, are those experienced in abuse. These effects are dose-related; that is, the effects are dependent upon the content of active material tetrahydrocannabinols, in particular. The impression that marijuana is a harmless drug has been fostered by the low content of active material in American samples however, use of the more potent hashish is increasing. The immediate physical effects of smoking one or more marijuana cigarettes include:

- a. Throat irritation
- b. Increased heart rate
- c. Reddening of the eyes
- d. Occasional dizziness, incoordination, or sleepiness
- e. Increased appetite

The psychological effects vary from individual to individual and with the amount of the drug taken. Among the effects described are feelings of exhilaration, hilarity, and conviviality, but there is

also distortion of time and space perception, and there may be disturbance of psychomotor activity, which would impair driving and other skills.

In some individuals and in connection with excessive use of the drug, a psychotoxic reaction resembling a "bad trip" on LSD may occur.

Many persons try marijuana once or twice and then abandon it; some use it intermittently usually in the company of others and many use the drug continually. Marijuana can produce psychic dependence, but there is no evidence of physical dependence, and no withdrawal symptoms follow discontinuance.

2. First aid

There is no need for emergency treatment unless a psychotoxic reaction develops, in which case the approach is the same as that for an LSD "bad trip."

C. Depressants (sedatives-hypnotics)

1. Characteristics and types.

Depressants (downers) are drugs that act on the nervous system, promoting relaxation and sleep. Chief among these drugs are the barbiturates, the more important of which are

- a. Phenobarbital (goofballs)

- b. Pentobarbital (yellow jackets)

c. Amobarbital (blue devils)

d. Secobarbital (red devils)

Closely related are the nonbarbiturate sedatives, some of which are:

a. Glutethimide (Doridan)

b. Chloral hydrate (knockout drops)

c. Paraldehyde

2. Effects

A usual therapeutic dose of a barbiturate does not relieve pain but has a calming, relaxing effect that promotes sleep. Reactions include:

a. Relief of anxiety and excitement

b. Tendency to reduce mental and physical activity.

c. Slight decrease in breathing.

Barbiturates are used to reduce the frequency of convulsions in epileptics, and one in particular Pentothal is given intravenously as a preoperative sedative.

An overdose of barbiturates produces unconsciousness, deepening to a coma, from which the victim cannot be roused. Barbiturates are frequently involved in instances of accidental death or intentional suicide.

Some accidental poisonings occur when a person becomes confused, as a dose of barbiturates start to take effect and inadvertently takes a second dose. Another cause of accidental poisoning is the mutual enhancement of effect that takes place when a barbiturate is taken in conjunction with alcohol. This combination can be lethal, even in small amounts.

3 . Abuse

Barbiturates are commonly abused in two ways:

- a. The barbiturate is taken in increasing amounts by persons who have developed tolerance to the drug, and thus require larger and larger doses to feel the desired effects.
- b. For a thrill, the barbiturate is injected as an alternate to other drugs that are being abused, particularly amphetamines. Barbiturates can produce dependence, both psychic and physical.

Abrupt discontinuance of barbiturate administration to the dependent person causes the following characteristic withdrawal symptoms:

- a. Restlessness, insomnia, and tremors
- b. Muscular twitching
- c. Nausea and vomiting
- d. Convulsions

e. Delusions and hallucinations

The convulsions and the psychotic symptoms seldom occur at the same time. The convulsions are likely to occur on the second or third day of withdrawal, the delusions and hallucinations a little later. The other symptoms usually occur within 24 hours of withdrawal. If the individual is not treated, the symptoms last about a week. Abrupt withdrawal of barbiturates is dangerous. withdrawal should take place gradually and under medical supervision. The dependent person should be persuaded to get help from a physician or a drug abuse treatment center.

4. First aid

- a. Maintain an open airway and give the victim artificial respiration, if indicated.
- b. Maintain body temperature.
- c. Get the victim to a physician or hospital as soon as possible.

D. Hallucinogens

1. Characteristics and types

Hallucinogens are drugs that are capable of producing mood changes, frequently of a bizarre character; disturbances of sensation, thought, emotion, and self-awareness; alteration of time and space perception; and both illusions and delusions. The

most important hallucinogen is lysergic acid diethylamide (LSD) .

Some others are:

- a. Mescaline
- b. Psilocybin
- c. Morning glory seeds
- d. A number of synthetic substances

Since none of these substances presently has been accepted for medical use, the effects to be described are those experienced in abuse.

2. Effects

Abuse of hallucinogens is of the spree type; The drug is taken intermittently, although perhaps as often as several times a week. Many persons develop a psychic drive for repetition of the experience, but physical dependence does not develop.

The effects may often be seen pleasurable and rewarding but they may also be very unpleasant (a "bad trip"), even in the same individual. LSD, for example, is likely to produce these physical effects.

- a. Increased activity through its action on the central nervous system.
- b. Increased heart rate
- c. Increased blood pressure

d. Increased body temperature

e. Dilated (enlarged) pupils.

f. Flushed face

The psychological effects of hallucinogens, in general, are highly variable and unpredictable. They include an emergence into consciousness of previously suppressed ideas, strong emotional feeling, an impression of astonishingly lucid thought, a feeling of insight and creativity, and an intensification of sensory impressions. Changes in sensation may also be involved (sounds are seen, ordinary things appear beautiful, colors seem to be heard). A feeling of cosmic oneness, profound religious awareness, and a mood of joy and peace also may mark the use of the hallucinogens.

In the bad trip, or "freak-out," there is an intense experience of fear, or nightmarish terror to the point of panic. Other undesirable effects are:

a. Complete loss of emotional control

b. Paranoid delusions

c. Hallucinations

d. Profound depression

e. Tension and anxiety

Disordered social behavior may also occur. Because of the delusions and disordered sensations, the user may think he is immune to harm, or perhaps able to fly, and may suffer severe physical injury. Flashbacks (sensory replays of previous "trips") are associated with the use of hallucinogenic drugs, such as LSD, and such flashbacks may occur months after the drug has been taken. They may be severe or simply amount of a feeling of dizziness or a temporary blackout.

3. First Aid

A person on a "trip," good or bad, needs careful attention, reassurance, and protection from bodily harm or the results of his antisocial behavior.

- a. Talk the person down from his disturbing experience in quiet and safe surroundings.
- b. Get the victim to a physician or hospital as soon as possible. Two persons should accompany him if possible.

E. Inhalants

Occasional self administration of volatile substances such as ether or chloroform in order to experience intoxication is a very old practice.

1. Types

In recent years, inhalation of a wide variety of substances, a practice commonly referred to as glue sniffing, has become

widespread among young people in their early teens. The substances inhaled include-

- a. Fast-drying glue or cement (such as model airplane glue)
- b. Many paints and lacquers and their thinners and removers
- c. Gasoline
- d. Kerosene
- e. Lighter fluids and dry-cleaning fluid
- f. Nail polish and remover

The usual methods of inhaling are to hold a cloth over the nose and mouth with some of the substance on it or to cover the head with a paper or plastic bag containing a quantity of the substance.

2. Effects

The effects resulting from the use of inhalants are those experienced in abuse. Reactions are-

- a. Initial excitement resulting from release of inhibitions
- b. Irritation of the respiratory passages
- c. Unsteadiness
- d. Drunkenness, with growing depression that deepens even to unconsciousness.

A serious potential danger accompanies waning consciousness in a person who uses a bag over his head for inhaling. Failure to remove the bag may result in suffocation.

Some of the propellants in the aerosols that are inhaled are toxic to the heart and can cause death by alteration in rhythm of the heartbeat. This situation requires prompt and intensive medical attention. Persistent use of inhalants may cause some psychic dependence and may produce pathological changes in the liver and other organs.

3. First aid

- a. If a person is found with a bag or other apparatus over his head, remove it immediately.
- b. If breathing stops, administer artificial respiration.
- c. Obtain medical assistance immediately.

F. Narcotics

1. Types

"Narcotics" refers, in general, to opium and specifically to-

- a. Preparations of opium, such as paregoric
- b. Substances found in opium (Morphine and codeine)
- c. Substances derived from morphine (heroin, Dilaudid, etc.)

- d. Synthetic (laboratory-made) substances that have morphinelike effects, including meperidine or Demerol, methadone or Dolophine

In late 1970, federal laws governing the control of narcotics appropriately excluded cocaine and marijuana from the narcotics classification. Cocaine is a stimulant that effects the central nervous system, and marijuana is a mood-and sense- altering substance.

2. Effects

A therapeutic dose of a narcotic relieves pain and reaction to pain, calms anxiety, and promotes sleep. Common reactions to morphine, heroin, and other morphinelike agents include-

- a. Reduction in awareness of pain
- b. Quieting of tension and anxiety
- c. Decrease in activity
- d. Promotion of sleep
- e. Decrease in breathing and pulse rate
- f. Reduction of hunger and thirst

Some unpleasant reactions to narcotics include sweating, dizziness, nausea, vomiting, and constipation.

An overdose of a narcotic results in:

- a. Lethargy and increasing reduction in activity and awareness.
- b. Sleep, deepening to coma (prolonged unconsciousness)
- c. Increasing depression of breathing to the point of respiratory failure.
- d. Profuse sweating
- e. Fall in temperature
- f. Muscle relaxation
- g. Contraction of pupils to pinpoint, except with meperidine.

3. Abuse

The continued administration of a narcotic produces both psychic and physical dependence. Discontinuing the drug causes the appearance of the characteristic, recognizable withdrawal symptoms within from 6 to 24 hours. The symptoms and signs include:

- a. Nervousness, restlessness, and anxiety
- b. Tears and a running nose
- c. Sweating, hot and cold flashes, and gooseflesh
- d. Yawning
- e. Muscular aches and pains in legs, back and abdomen

- f. Nausea, vomiting, and diarrhea (uncontrollable and continuous)
- g. Loss of appetite and loss of weight
- h. Dilated (enlarged). pupils.
- i. Increased breathing, blood pressure, and body temperature
- j. Intense craving for the drug(for a "Fix")

If withdrawal symptoms are in evidence they may be promptly relieved by a dose of the same drug or of another drug in the same group. There is little the lay person can do for the individual in withdrawal except to reassure him and to persuade him to go to a drug treatment center or a physician. Other problems associated with the abuse of narcotics are infection, resulting from the use of unsterile needles, the possibility of developing hepatitis, and malnutrition and dental caries (decay) due to neglect of dietary and hygienic practices.

4. First aid

- a. Arouse the victim, if possible, by lightly slapping him with a cold, wet towel and try to get him on his feet.
- b. Maintain an open airway and administer artificial respiration if indicated.
- c. Maintain body temperature
- d. Avoid rough treatment of the victim

- e. Reassure the victim and seek medical assistance as soon as possible.

G. Stimulants

Stimulants (uppers) are used to increase mental activity and to offset drowsiness and fatigue.

1. Types

The most commonly abused stimulants are:

- a. Amphetamine (Benzedrine-bennies, pep pills)
- b. Dextroamphetamine (Dexedrine-dexies)
- c. Amphetamine (Methedrine-meth, speed, crystal)
- d. Methylphenidate (Ritalin)

All of these act similarly and will be described as exemplified by amphetamine.

Caffeine and cocaine are included among the stimulants.

Caffeine is a constituent of coffee, tea, and other beverages. It may produce a very mild psychic dependence but it does not cause personal or social damage. Cocaine, used medically as a local anesthetic, is a powerful central nervous system stimulant.

2. Effects

A therapeutic dose of amphetamine produces the following effects:

- a. Alertness
- b. Wakefulness
- c. Relief from fatigue
- d. A feeling of well-being

Mental and physical performance may increase to some extent. Amphetamine reduces hunger and has been widely used for this purpose, although the effect is not well sustained, and the feelings of alertness and wakefulness wear off. Amphetamine increases blood pressure, breathing rate, and general bodily activity. Tolerance to the effects of amphetamine can develop to a high degree, resulting in a demand for increased doses.

An overdose of amphetamine may produce toxic effects when taken orally, but these effects are more common when amphetamine is taken by intravenous injection. Use of amphetamines as antiobesity agents (diet pills) has limited value, and there is little recognized medical need for these drugs, although they are occasionally used in treating narcolepsy (uncontrollable desire for sleep) or hyperkinetic (overactive) states.

3 . Abuse

Amphetamine abuse can produce strong psychic dependence and a pronounced degree of tolerance, but not physical dependence.

Prolonged administration of oral doses for diet or fatigue control, because of the accompanying sense of well-being, frequently leads to abuse when doses are increased in an effort to maintain the effect. This abuse produces a psychic dependence on the drug, but withdrawal should be possible without serious incident.

In recent years, a form of amphetamine abuse involving repeated intravenous injection of the drug (usually Methedrine or Dexedrine) has developed. Called a "speed run," this abuse is accompanied by considerable risk to the user and the people around him. The pattern of abuse begins with several days of repeated injections, which increase in size and frequency. The daily total sometimes reaches more than 100 times the initial dose.

At first, the user may feel energetic, talkative, enthusiastic, happy, and confident. He does not sleep and usually eats little or nothing. After a few days, unpleasant symptoms appear and increase as the dosage increases. These symptoms include:

- a. Confusion
- b. Disorganization
- c. Compulsive repetition of small, meaningless acts
- d. Irritability
- e. Suspiciousness
- f. Fear

- g. Hallucinations and delusions, which may become paranoid
- h. Aggressive and antisocial behavior, which may endanger others

The run, which usually lasts less than a week, is abruptly terminated. The abuser is left exhausted. He sleeps sometimes for several days and, upon awakening, is emotionally depressed, lethargic, and extremely hungry. Shortly, another run is begun, and the cycle is repeated. There is little that can be done for the victim except to protect him against injury and to seek psychiatric help for him for his delusions and hallucinations.

Abuse of cocaine may take a form similar to the speed run, with rapid, repeated intravenous injections followed by psychotoxic symptoms similar to those characteristic of amphetamine, particularly delusions of a paranoid nature. Another cocaine abuse practice is the taking of the drug alternately or concurrently with heroin. In combinations, cocaine provides the "up" and heroin the "down." Cocaine abuse results in strong psychic dependence but not physical dependence.

4. First aid

- a. Protect the victim against injury.
- b. Maintain an open airway and administer artificial respiration if indicated.
- c. Maintain body temperature

- d. Obtain psychiatric help for the victim for his delusions and hallucinations.

H. Tranquilizers

1. Types and abuse

Agents in this category are commonly referred to as major and minor tranquilizers. The major tranquilizers include the phenothiazines (chlorpromazine, for example) and reserpine. They are used in treating mental disease to calm psychotic patients. They have not produced dependence, but overdosage of these drugs produces a deepening state of unconsciousness, a fall in body temperature and blood pressure, and eventual respiratory failure. The effects produced by an overdose are prolonged, and the victim must be watched carefully as long as severe central nervous system depression persists.

The minor tranquilizers are used to calm anxiety and other feelings of stress and excitement without producing sleep. At highdose levels, their effects are virtually indistinguishable from the effects of the sedative hypnotics. Common examples of minor tranquilizers are:

- a. Meprobamate (Miltown, Equanil)
- b. Chlordiazepoxide (Librium)
- c. Ethchlorvynol (Placidyl)

d. Diazepam (Valium)

Some tranquilizers are used in treating chronic alcoholism, but in effect, this usage represents substitution of one depressant drug for another. These drugs are useful in treating acute alcohol withdrawal.

Prolonged administration of a minor tranquilizer, with a tendency to increase the dose, may result in psychic and physical dependence. The characteristics of dependence on minor tranquilizers and the related withdrawal symptoms are similar to those produced by barbiturates.

2. First aid

- a. Arouse the victim, if possible, by lightly slapping him with a cold, wet towel and try to get him on his feet.
- b. Maintain an open airway and administer artificial-respiration if indicated.
- c. Maintain body temperature.
- d. Get the victim to a physician, hospital, or drug abuse treatment center as soon as possible.

Section 9

BURNS

9.1 LEARNING GOAL: The student will have a working knowledge of the three classifications of burns and their causes.

PERFORMANCE OBJECTIVES:

9.1.1 The student will list the three basic classifications of burns and their causes.

9.2 LEARNING GOAL: The student will know the signs and symptoms of 1st, 2nd, and 3rd degree burns.

PERFORMANCE OBJECTIVES:

9.2.1 The student will verbally or in writing list the signs and symptoms for a 1st, 2nd, and 3rd degree burn.

9.3 LEARNING GOAL: The Student will know the do's and don't of emergency first aid care for burns of all types and classifications.

PERFORMANCE OBJECTIVE :

9.3.1 The student will identify three specific types and classification of burns and give the proper emergency care for that burn.

9.4 LEARNING GOAL: The student will know some basic preventative measures to take in avoiding burn injuries.

PERFORMANCE OBJECTIVE :

9.4.1 The student will list the preventative measures to take in dealing with general burn cases.

RESOURCE MATERIAL:

I. DEFINITION

A burn is an injury that results from heat, chemical agents, or radiation. It may vary in depth, size, and severity, causing injury to the cells in the affected area.

II. CAUSES AND EFFECTS

A. Causes

Burns are caused most commonly by:

1. Carelessness with matches and in cigarette smoking
2. Scalds from hot liquids
3. Defective heating, cooking, and electrical equipment.
4. Use of open fires that produce flame burns, especially when flammable clothing is worn.
5. Unsafe practices in the home, in the use of flammable liquids for starting fires, for cleaning, and for scrubbing wax off floors.
6. Immersion in overheated bath waters.
7. Use of chemicals, such as lye, strong acids, and strong detergents.

B. Hazards

In addition to surface burns and the effects of heat on the blood and on body tissues other than the skin, the hazards of fire include the following:

1. Inhaling very hot (superheated) air or irritating or poisonous gases, including carbon monoxide.
2. Asphyxia from insufficient oxygen in the air.
3. Falls and injuries from collapsing walls in burning buildings.

III. CLASSIFICATION

Burns are usually classified according to depth or degree of skin damage.

Often the degree will differ in various parts of the same affected area.

A. First degree

First degree burns are those resulting from overexposure to the sun, light contact with hot objects, or scalding by hot water or steam. The usual signs are:

1. Redness or discoloration .
2. Mild swelling and pain.
3. Rapid healing.

NOTE: severe sunburn should receive medical care as soon as possible.

B. Second degree

Second degree burns are those resulting from a very deep sunburn, contact with hot liquids, and flash burns. Second degree burns are usually more painful than deeper burns in which the nerve endings in the skin are destroyed. The usual signs are:

1. Greater depth than first-degree burns
2. Red or mottled appearance
3. Development of blisters
4. Considerable swelling over a period of several days.
5. Wet appearance of the surface of the skin, due to the loss of plasma through the damaged layers of the skin.

C. Third degree

Third degree burns can be caused by a flame, ignited clothing, immersion in hot water, contact with hot objects, or electricity. Temperature and duration of contact are important factors in determining the extent of tissue destruction. The usual signs are:

1. Deep tissue destruction
2. White or charred appearance (At first, the burn may resemble a second degree burn.)
3. Complete loss of all layers of the skin

IV. EXTENT AND LOCATION

In addition to classification of burns according to depth or degree, burns are ordinarily described according to the extent of the total body surface involved. In general, an adult who has suffered burns of 15 percent of his body surface (a child, 10 percent), wherever located, requires hospitalization. Burns of the face are often associated with injury to the respiratory tract, and may obstruct breathing as swelling increases. Prompt medical attention is imperative.

V. FIRST AID

The objective of first aid for burns is to relieve pain, prevent contamination, and treat for shock. Usually, medical treatment is not required.

A. First-degree burns

1. Apply cold water applications, or submerge the burned area in cold water.
2. Apply a dry dressing if it is necessary.

B. Second-degree burns

1. Immerse the burned part in cold water (not ice water) until the pain subsides.
2. Apply freshly ironed or laundered cloths that have been wrung out in ice water.
3. Blot dry, gently.
4. Apply dry, sterile gauze or clean cloth as a protective bandage.

5. Do not break blisters or remove tissue.
6. Do not use an antiseptic preparation, ointment, spray, or home remedy on a severe burn.
7. If the arms or legs are affected, keep them elevated.

C. Third degree burns

1. Do not remove adhered particles of charred clothing.
2. Cover burns with thick, sterile dressings or a freshly ironed or laundered sheet or other house hold linen.
3. If the hands are involved, keep them above the level of the victim's heart.
4. Keep burned feet or legs elevated. (The victim should not be allowed to walk.)
5. Have victims with face burns sit up or prop them up and keep them under continuous observation for breathing difficulty. If respiration problems develop, an open airway must be maintained.
6. Do not immerse an extensive burned area or apply ice water over it, because cold may intensify the shock reaction. However, a cold pack may be applied to the face or to the hands or feet.
7. Arrange transportation to the hospital as quickly as possible.
8. If medical help or trained ambulance personnel will not reach the scene for an hour or more and the victim is conscious and not vomiting, give him a weak solution of salt and soda at home

and en route: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water, neither hot nor cold.

Allow the victim to sip slowly. Give about 4 ounces (a half glass) to an adult over a period of 15 minutes. Give about 2 ounces to a child from 1 to 12 years of age, and about 1 ounce to an infant under 1 year of age. Discontinue fluid if vomiting occurs.

If medical help will not be available within an hour or more, fluids may be given if not otherwise contraindicated. (Do not give alcohol.)

9. Do not apply ointment, commercial preparations, grease, or other home remedy. (Such substances may cause further complications and interfere with treatment by the physician.)

D. Chemical burns of the skin

For chemical burns of the skin, first aid steps are:

1. Wash away the chemical with large amounts of water, using a shower or hose, if available, as quickly as possible and for at least 5 minutes. Remove the victim's clothing from the areas involved.
2. If first aid directions for burns caused by specific chemicals are available, follow these directions after the initial flushing with water.
3. Apply a dressing bandage and get medical aid.

E. Burns of the eye

1. Acid burns

First aid for acid burns of the eye should begin as quickly as possible by thoroughly washing the face, eyelids, and eye for at least 15 minutes.

If the victim is lying down, turn his head to the side, hold the eyelids open, and pour water from the inner corner of the eye outward. Make sure the chemical does not wash into the other eye.

- a. If a weak soda solution (1 teaspoonful of baking soda added to 1 quart of water) can be made quickly, use the solution after first washing the eye with tap water.
- b. Cover the eye with a dry, clean, protective dressing (do not use cotton) and bandage in place.
- c. Caution the victim against rubbing his eye.
- d. Get medical help immediately (preferably, an eye specialist).

2. Alkali burns

Alkali burns of the eye can be caused by drain cleaner, strong laundry and dishwater detergents, or other cleaning solutions and are progressive injuries. An eye that first appears to have only

slight surface injuries may develop deep inflammation and tissue destruction and the sight may be lost.

a. First aid

(1) Flood the eye with water for 15 minutes.

(2) If the victim is lying down, turn his head to the side.

Hold the lids open and pour the water from the inner corner outward.

(3) Remove any loose particles of dry chemicals, on the eye, by lifting them off gently with a sterile gauze or a clean handkerchief.

(4) Do not irrigate with soda solution.

(5) Immobilize the eye with a dry pad or protective dressing.

(6) Seek immediate medical aid.

3. Irritating gases

a. Effects

Injuries to the eye from irritating gases are common, and lung damage also may result if sufficient quantity is involved. Many drugs and chemicals are used in spray form. Tear gas concentrated form may cause blindness and should be handled carefully.

b. First aid

First aid consists of irrigation of the eyes with large quantities of water.

F. Prevention of sunburn

The most effective sunburn prevention lies in limiting the length of initial exposures at the beginning of warm weather each year, especially for individuals sensitive to the sun. For swimming and sunbathing, the first exposure should not be longer than 15 minutes, with gradual increases of from 5 to 10 minutes. On beaches and while boating or fishing during the summer, however, both children and adults should avoid long exposures from midmorning until midafternoon. Sunburn may develop following exposure even on cloudy day. Persons engaged in outdoor work or sports should wear protective clothing during this critical period, and those with light complexions should cover their hands and faces with suitable ultraviolet light screening preparations.

Commercial preparations for sunburn protection vary in their effects. Most preparations contain oils to keep the skin from drying on exposure to heat, wind, and water. Some have hardly any protective effects; others are highly effective but expensive. Many of these preparations may cause allergic reactions in individual cases. A small sample should be tested on the skin before liberal amounts are used. Preparations that protect against ultraviolet rays should be reapplied after swimming.

The eyes, as well as the skin, should be protected, either by shade or by sunglasses, against irritation from overexposure to the glare of sun, sand, water, ice, and snow.

VI. PREVENTION OF HEAT EMERGENCIES

The following information relates to the more common conditions and activities that produce heat emergencies. A responsible attitude toward acquiring additional preventive information, particularly in regard to fires and burns, should lead the reader to resources beyond the discussion contained herein.

A. Injuries from extreme heat

Fires, burns, and other emergencies produced by fire are the third leading cause of accidental death. About 20 percent of the fatalities are children. The home environment is particularly dangerous. Some four out of five deaths due to fire occur in the home. In addition, numerous persons are affected by nonfatal burn injuries each year. Prevention of burns is, essentially, a matter of preventing fires, as well as protection of self and others from sources of extreme heat other than fire.

1. Smoking and matches

Home fires and burn injuries are often the result of children playing with matches and careless handling of matches by adults. When the hazards of dangerous play are not fully understood by children, protective measures similar to those controlling

accessibility to dangerous poisons should be followed. Careless handling or disposal of matches and lighted cigarettes is a primary factor in the cause of about 25 percent of all fires of known origin.

Smoking while in bed is one of the most frequent causes of fire in homes and place of public accommodation. In addition to the danger of burns, a fire in bedding also releases toxic gases that can quietly suffocate sleeping persons in the room or in other parts of the building. Considering the number of fire fatalities where smoking in bed has been identified as the primary causative factor, smokers should see that the practice seems most unwise.

2. Cooking and heating equipment

Cooking and heating equipment is a common source of fires and burns. It is very important that equipment be kept clean and in good repair. A qualified person should inspect and clean heating systems and chimneys annually. If repairs are needed, an expert should be called upon.

Flammable liquids create a special handling and storage problem. If a stove uses fuel oil, store surplus quantities outdoors. Do not use highly flammable liquids for household purposes or for lighting a charcoal grill or other fire. Store flammable liquids in safety containers that seal off explosive vapors from the air. Any flame or spark can produce an explosive like flash fire wherever a

concentration of volatile fumes exists. Similar precautions are necessary where gas is used as a fuel. If a pilot light or gas burner blows out, ventilate thoroughly, and then carefully follow the manufacturer's directions in relighting the unit.

Fire and burn prevention also requires that good housekeeping and safe personal practices be followed in the use of cooking and heating equipment. Cooking surfaces should be kept clean from grease. Turn pot handles so that they do not stick out over the edge of a stove; otherwise, children might pull scalding liquids down upon themselves. Keep portable space heaters out of room traffic lanes and turn them off before going to bed. Make sure that curtains cannot blow across cooking surfaces and that loose clothing is not worn around cooking surfaces. Remember, too, that children need special protection from these and other potentially hazardous fire situations.

3. Fires of electrical origin

Fires of electrical origin are usually the result of overloaded or defective wiring, and worn-out or damaged power tools, appliances, fractional horsepower motors, fixture outlets, and cords.

Many older homes are not electrically wired to accommodate the number of appliances and amount of electrical equipment that are in common use today. In such homes, it is most important that fuses are the right size so that circuits are protected from

becoming overloaded. A fuse or a circuit breaker, which acts as a safety valve for overloaded circuits, shows or cuts off the current so that wiring will not overheat and create a fire.

Fire and burn protection also requires worn-out or damaged tools, appliances, cords, and other electrical items to be either discarded or repaired. Repairs should be made by qualified repairmen. Repairs are particularly important where television sets are concerned. Unless a television set is designed specifically for installation in a tightly enclosed space, do not install it where required ventilation will be obstructed; a fire hazard can be created if adequate ventilation is not provided.

An absence of grounded circuits and electrical appliances or equipment without grounded wiring poses the ever present danger that a current of electricity can reach and pass through the body. A three holed wall receptacle implies a grounded circuit. A three pronged plug on an appliance cord or piece of electrical equipment implies that the item is wired to afford protection against electric current's reaching the body provided that the item is plugged into a grounded circuit. Whenever a manufacturer recommends that electrical appliances or equipment should be grounded, follow the advice. If both the circuit and the appliance are improperly wired and plugged for grounding, have a competent electrician inspect the circuit

wiring, circuit load, and wall receptacle, and request him to ground the piece of equipment or appliance.

B. Radiation burns

The usual source of radiation burns is an overexposure to the ultraviolet rays of the sun during warm weather seasons. Light complexioned persons are particularly susceptible to burning by the sun's rays. Sunburn can be prevented by controlling the amount of exposure to ultraviolet rays until a suntan has developed, and by avoiding excessive exposure, particularly during the midmorning to midafternoon period, when the amount of ultraviolet radiation is greatest.

The first few exposures at the beginning of an outdoor season should be limited to periods of no more than 15 minutes. Later exposures should be regulated so that a protective suntan can develop gradually. Commercial skin preparations that are made specifically to screen out ultraviolet rays may also be helpful. Some commercial preparations have little protective effects against ultraviolet rays, and any one of them may cause an allergic reaction in individual cases. A person may wish to check with his own physician for advice in selecting a sunburn prevention preparation. For best results when using a particular preparation, follow directions on the container label.

Persons who spend a great deal of time in the hot sun should avoid excessive exposure by wearing protective clothing and using a

sunburn preventive preparation on the hands, neck, and face.

Remember, too, that cloudy weather does not ensure protection against ultraviolet ray exposure.

The eyes also need protection from long exposure to sunlight and glare. While a cap visor may shield the eyes from sun, sand, water, ice, and snow glare, protection against sunlight and water or surface reflection is best obtained by wearing sunglasses. Seek professional advice about the selection of effective sunglasses.

C. Chemical burns

Prevention of chemical burns would be almost universally accomplished if people would heed the warnings and fully read and follow instructions printed on the original containers of products.

Eye tissue is particularly vulnerable. Special precautions are necessary in the handling and use of sprays, gases, and the many household and garden products containing caustic chemical compounds that can be splashed or rubbed into the eyes.

Make a normal practice of carefully reading the label of every spray can, as well as any package containing laundry or dishwashing products, insecticides, pesticides, hair sprays, deodorants, garden and soil products, antiseptics, or medicines. Since these chemicals are also dangerous if swallowed or inhaled, the same preventive measures regarding security and storage as suggested in the chapter on accidental poisoning should be followed.

D. Specific fire or burn prevention

Install fire extinguishers in danger spots keep a garden hose near a faucet for use in case of fire Install adequate insulation at all heating surfaces. Repair or replace defective or inadequate electrical wiring. Perform the required maintenance on heating systems. Dispose of trash immediately. Use only nonflammable cleaning fluids. Hang clothes well away from stoves or fireplaces. Place curtains so that they will not blow into flames from any stove, candle, etc. Store flammable materials in a safe place. Do not overload electrical circuits. Supervise children playing near an open fire. Store matches in a metal container and out of reach of children.

Turn pot and pan handles away from the edge of the stove.

Do not leave tubs of hot water where children can fall into them.

Do not smoke in bed.

Do not smoke if you are sleepy.

Provide adequate ashtrays throughout the house.

Install home fire detectors.

E. Escape from fire

Every family should have a fire escape plan that includes at least two possible ways to get outdoors from every room in the house. Emergency exit plans should be discussed and practiced until each family member knows exactly what to do. The two most important

things to remember in case of fire are, first, to get everybody out of the house, and then to call the fire department. For example, since heated air and carbon monoxide gas tend to rise, persons should stay close to the floor. Any part of the body covered by a thick cloth, particularly if the cloth is wet, will be protected for a time from heat, but not from fumes. It is especially important to protect the hands, face, and respiratory passages. There is actually no satisfactory protection against carbon monoxide, but the lowest concentration of gas will be found in air near the floor. If clothing catches fire, do not run; roll on the floor or ground. Smother the flaming clothes of another person with a coat of blanket. When attempting escape, place the palm of your hand against any inside door before opening it. If the door feels hot, either leave by another exit or wait at a window for rescue. Open the window slightly, from the bottom, so that fresh breathing air can be obtained. Hang clothing or a bedsheet from the window to signal rescuers. If a door feels cool to the touch, open it slightly, staying low and behind the door. The next room may contain superheated air, under pressure, that could explode as it expands. Pass your hand across the door opening, and if the air feels cool, it should be safe to enter.

Close doors behind you upon leaving rooms and the house. Fire travels faster when doors and windows are open. After everybody is safely out of the house, call the fire department, giving your name and the address where the fire is located.

F. Prevention of heat illnesses

The extent to which various body systems can adapt to a hot climate or hot working conditions, exposure to alternately high and low temperatures extremes, and conditions of high and low humidity is apparently related to an individual's ability to avoid heat illnesses.

This systemic adaptation ability varies among individuals.

Drinking adequate amounts of water and increasing the intake of salt are two preventive measures that may help to avoid heat illness, particularly in the case of heat exhaustion and heat cramps.

Restriction of activity, good ventilation and movement of air by fans and air conditioning, moderate eating habits, and the wearing of loose and light colored clothing in hot, sunny weather can help lower the incidence of heat reactions.

Heat stroke is an immediate, life threatening problem. The cooling of body surfaces, such as the exposed face, neck, and arms, by periodic sponging with cool water is sometimes helpful in preventing the onset of heat stroke. Exposure and activity should be limited where extremely hot climatic and working conditions permit, particularly in the case of young children, elderly persons, and other people known to be susceptible to the effects of extreme heat.

Section 10

FROSTBITE AND COLD EXPOSURE

10.1 **LEARNING GOAL:** The student will have the basic knowledge to deal with frostbite and cold exposure emergencies.

PERFORMANCE OBJECTIVES:

10.1.1 The student will in essay form list the proper procedure in dealing with the victim of frostbite and cold exposure. He will also list basic prevention techniques.

RESOURCE MATERIAL:

The extent of injury caused by exposure to abnormally low temperature generally depends on such factors as wind velocity, type and duration of exposure, temperature, and humidity.

Freezing is accelerated by wind and humidity or a combination of the two factors.

I. **FROSTBITE**

A. Characteristics

Frostbite results when crystals form, either superficially or deeply in the fluids and underlying soft tissues of the skin. The effects are more severe if the injured area is thawed and then refrozen.

Frostbite is the most common injury resulting from exposure to cold

elements. Usually, the frozen area is small. The nose, cheeks, ears, fingers, and toes are most commonly affected.

B. Signs and symptoms

Just before frostbite occurs, the affected skin may be slightly flushed. As frostbite develops:

1. The skin changes to white or grayish yellow in appearance.
2. Pain is sometimes felt early but subsides later (often there is no pain).
3. Blisters may appear later.
4. The affected part feels intensely cold and numb.
5. The victim frequently is not aware of frostbite until someone tells him or he observes the pale, glossy skin. As time passes:
 - a. There is mental confusion and impairment of judgment.
 - b. The victim staggers.
 - c. Eyesight fails.
 - d. The victim falls and may become unconscious.
 - e. Shock is evident.
 - f. Breathing may cease.
 - g. Death, if it occurs, is usually due to heart failure.

C. First aid

1. Objectives

The objectives of first aid are to protect the frozen area from further injury, to warm the affected area rapidly, and to maintain respiration.

2. Procedure

- a. Cover the frozen part.
- b. Provide extra clothing and blankets.
- c. Bring the victim indoors as soon as possible.
- d. Give the victim a warm drink.
- e. Rewarm the frozen part quickly, by immersing it in water that is warm, but not hot, when tested by pouring some of the water over the inner surface of your forearm. Place a thermometer in the water and carefully add warm water to maintain the temperature between 102 F and 105 F. NOTE: If the affected part has been thawed and refrozen, it should be warmed at room temperature (from 70 F to 74 F).
- f. If warm water is not available or practical to use, wrap the affected part gently in a sheet and warm blankets.
- g. Do not rub the part; rubbing may cause gangrene (tissue death).

- h. Do not apply heat lamp or hot water bottles.
- i. Do not let the victim bring the affected part near a hot stove.
- j. Do not break the blisters.
- k. Do not allow the victim to walk after the affected part thaws, if his feet are involved.

(Since severe swelling develops very rapidly after thawing, discontinue warming the victim as soon as affected part becomes flushed).

- m. Once the affected part is rewarmed, have the victim exercise it.
- n. If fingers or toes are involved, place dry, sterile gauze between them to keep them separated.
- o. Do not apply other dressings unless the victim is to be transported for medical aid.
- p. If travel is necessary, cover the affected parts with sterile or clean cloth and keep the injured parts elevated.
- q. Elevate the frostbitten parts and protect them from contact with bedclothes.
- r. Give fluids as described in the chapter on burns, provided that the victim is conscious and not vomiting.
- s. Obtain medical assistance as soon as possible.

II. COLD EXPOSURE

A. Manifestations

Prolonged exposure to extreme cold produces the following manifestations:

1. Shivering
2. Numbness
3. Low body temperature
4. Drowsiness
5. Marked muscular weakness

B. First aid

1. Give artificial respiration, if necessary.
2. Bring the Victim into a warm room as quickly as possible.
3. Remove wet or frozen clothing and anything that is constricting.
4. Rewarm the victim rapidly by wrapping him in warm blankets, or by placing him in a tub of water that is warm but not hot to the hand or forearm.
5. If the victim is conscious, give him hot liquids by mouth (not alcohol).
6. Dry the victim thoroughly if water was used to rewarm him.
7. Carry out appropriate procedures as described for frostbite.

III. PREVENTION OF INJURIES FROM EXTREME COLD

Frostbite occurs when skin tissue is subjected to extremely cold atmospheric conditions for a duration of time long enough to result in actual freezing of tissue fluids. Prevention involves limiting, if not avoiding, the duration of exposure to extreme cold, avoiding personal practices that may actually contribute to freezing of tissue, wearing proper protective covering, recognizing early symptoms of the onset of frostbite, and removal from such exposure.

If you must go outdoors into extremely cold air temperatures, particularly if high wind or humidity is also present, limit exposure time as much as possible. The danger of frostbite is increased if you are tired or your body's normal resistance is low because of a recent illness. Do not drink alcoholic beverages, smoke, or bathe immediately prior to going out into extremely cold air. Keep moving about in cold air; exercise fingers and toes if necessary, but avoid overexertion.

The right kind of protective clothing is more important. Thermal type woolen underclothing; outer garments that will repel wind and moisture; face helmet and head and ear coverings; an extra pair of socks; warm boots; and woolen lined mittens or gloves made of wind and water repellent material are all basic items of protective clothing desirable for use in extremely cold weather. Be certain that clothing, particularly footwear, is not tight that circulation is apt to become restricted. Keep clothing dry.

Finally, learn to recognize the symptoms that indicate onset of frostbite. Rest, shelter from wind and moisture, hot drinks, and an opportunity to warm cold body parts or to change damp clothing should be sought quickly when these early

symptoms are evidenced. Cold hands may be given some relief by placing them under dry clothing against the body, such as in the armpits.

Section 11

HEAT STROKE, HEAT CRAMPS & HEAT EXHAUSTION

11.1 **LEARNING GOAL:** The Student will know the definitions, causes, signs and symptoms and emergency treatment for (1) heat stroke, (2) heat cramps, and (3) heat exhaustion.

PERFORMANCE OBJECTIVE:

11.1.1 The student will define (1) heat stroke, (2) heat cramps, (3) heat exhaustion. The student will also list their signs and symptoms along with the proper emergency care for each.

RESOURCE MATERIAL:

Excessive heat may affect the body in a variety of ways, which result in several conditions referred to as heat stroke, heat cramps, and heat exhaustion.

I. DEFINITIONS

A. Heat stroke is a response to heat characterized by extremely high body temperature and disturbance of the sweating mechanism. Heat stroke is an immediate life threatening emergency for which medical care is urgently needed.

B. Heat cramps involve muscular pains and spasms due largely to loss of salt from the body in sweating or to inadequate intake of salt. Heat cramps may be associated also with heat exhaustion.

C. Heat exhaustion is a response to heat characterized by fatigue, weakness, and collapse due to intake of water inadequate to compensate for loss of fluids through sweating.

II. CAUSES

Heat reactions are brought about by both internal and external factors. Harmful effects occur when the body becomes overheated and cannot eliminate the excess heat. Reactions usually occur when large amounts of water, salt, or both are lost through profuse sweating following strenuous exercise or manual labor in an extremely hot atmosphere. Elderly individuals, small children, chronic invalids, alcoholics, and overweight persons are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails.

III. HEAT STROKE

A. Signs and symptoms

1. Body temperature is high may be 106 F or higher.
2. The skin is characteristically hot, red, and dry. The sweating mechanism is blocked.
3. The pulse is rapid and strong.
4. The victim may be unconscious.

B. First aid

First aid should be directed toward immediate measures to cool the body quickly. Take care, however, to prevent over chilling of the victim once his temperature is reduced below 102 F.

The following first aid measures are applicable whenever the body temperature reaches 105 F:

1. Undress the victim and, using a small bath towel to maintain modesty, repeatedly sponge the bare skin with cool water or rubbing alcohol; or apply cold packs continuously; or place the victim in a tub of cold water (do not add ice) until his temperature is lowered sufficiently. When the victim's temperature has been reduced enough, dry him off.
2. Use fans or air conditioners, if available, because drafts will promote cooling.
3. If the victim's temperature starts to go up again, start the cooling process again.
4. Do not give the victim stimulants.

IV. HEAT CRAMPS

A. Symptoms

In the case of heat cramps, the muscles of the legs and abdomen are likely to be affected first.

B. First aid

1. Exert firm pressure with your hands on the cramped muscles, or gently message them, to help relieve the spasm.
2. Give the victim sips of salt water (1 teaspoonful of salt per glass) , half a glass every 15 minutes, over a period of about 1 hour.

V. HEAT EXHAUSTION

A. Symptoms

1. Approximately normal body temperature
2. Pale and clammy skin
3. Profuse perspiration
4. Tiredness, weakness
5. Headache perhaps cramps
6. Nausea, dizziness (possible vomiting)
7. Possible fainting (But the victim will probably regain consciousness as his head is lowered)

B. First aid

1. Give the victim sips of salt water (1 teaspoonful of salt per glass, half a glass every 15 minutes) , over a period of about 1 hour.
2. Have the victim lie down and raise his feet from 8 to 12 inches.

3. Loosen the victim's clothing.
4. Apply cool, wet cloths and fan the victim or remove him to an air conditioned room.
5. If the victim vomits, do not give him any more fluids. Take the victim as soon as possible to a hospital, where an intravenous salt solution can be given.
6. After an attack of heat exhaustion, advise the victim not to return to work for several days and see that he is protected from exposure to abnormally warm temperatures.

Section 12

SUDDEN ILLNESS

12.1 LEARNING GOAL: The student will know the signs, symptoms, preventative measures if any and emergency care for the following sudden illnesses: (1) heart attacks, (2) strokes, (major and minor) , (3) simple fainting, (4) convulsions, (5) epileptic seizures and (6) diabetic related emergencies.

PERFORMANCE OBJECTIVE :

12.1.1 The student will respond verbally or in writing to questions dealing with sudden illnesses. These questions to include but not limited to signs, symptoms, preventative measures if any, and emergency care for (1) heart attacks, (2) strokes (major and minor) , (3) simple fainting, (4) convulsions, (5) epileptic seizures and (6) diabetic related emergencies.

RESOURCE MATERIAL:

First aid workers often encounter emergencies that are not related to injury but arise from either sudden illness or a crisis in a chronic illness. Unless the illness is minor and brief, such as a fainting attack, airsickness, a nosebleed or a headache, medical assistance should be sought. Although sudden illness is not always urgent, sometimes it endangers a person's life, especially if associated with a heart attack or a massive internal hemorrhage. An important first aid measure in such an instance is to secure transportation of the victim to receive medical care as quickly and safely as possible.

Many persons suffering from heart disease, apoplexy, epilepsy, or diabetes carry an identification card or bracelet that contains information about the type of illness and the steps to be followed if the persons are found unconscious. Search the victim (in the presence of witnesses) for such identification

I. HEART ATTACK

Heart attack usually involves a clot in one of the blood vessels that supply the heart. The attack is sometimes called a coronary since there is a loss of blood supply to a portion of the heart muscle (by blockage of the coronary arteries). A heart attack may or may not be accompanied by loss of consciousness. If the attack is severe, the victim may die suddenly. The victim may have a history of heart disease, or the attack may come with little or no warning. Attacks with mild pain sometimes occur. The degree of pain is not a good indication of the seriousness of the disease.

A. Signs and symptoms

1. Persistent chest pain, usually under the sternum (breastbone). The pain frequently radiates to one or both shoulders or arms or the neck or jaw or both.
2. Gasping and shortness of breath.
3. Extreme pallor or bluish discoloration of the lips, skin, and fingernail beds.
4. Extreme prostration

5. Shock (as a rule)
6. Swelling of the ankles, which may be an indication of heart disease.

The two principal symptoms of an acute heart attack are pain (in the chest, upper abdomen, or down the left arm and shoulder) and extreme shortness of breath. The symptoms can occur together, but usually one or the other is stronger. Indigestion, nausea, and vomiting are often associated with a heart attack.

B. First aid after a heart attack has occurred

1. Place the victim in a comfortable position, usually sitting up, particularly if there is shortness of breath, although his comfort is a good guide. Use as many pillows as needed.
2. Provide ventilation and guard against drafts and cold.
3. If the victim is not breathing, begin artificial respiration.
4. Have someone call for an ambulance equipped with oxygen, and have the victim's own doctor notified.
5. If the victim has been under medical care, help him with his prescribed medicine. (Look for some form of emergency medical identification.) If in doubt, confer with a physician by telephone.
6. Do not give liquids to an unconscious victim.

7. Since transportation throws added strain upon the victim, do not attempt to transport him until you get medical advice, if available within a reasonable time.

II. STROKE

A stroke (also called apoplexy) usually involves a spontaneous rupture of a blood vessel in the brain or formation of a clot that interferes with circulation.

A. Major stroke

1. Signs and symptoms

- a. Unconsciousness.
- b. Paralysis or weakness on one side of the body.
- c. Difficulty in breathing and in swallowing.
- d. Loss of bladder and bowel control.
- e. Pupils of the eyes unequal in size.
- f. Lack of ability to talk or slurring of speech.

2. First aid

- a. Provide moderate covering.
- b. Maintain an open airway.
- c. Give artificial respiration if indicated.
- d. Position the victim on his side so that secretions will drain from the side of the mouth.

- e. Call a doctor for medical advice as quickly as possible.
- f. Do not give fluids unless the victim is fully conscious and able to swallow and unless medical care will be delayed a long time.

B. Minor stroke

In a minor stroke, small blood vessels in the brain are involved. These usually do not produce unconsciousness, and the symptoms depend upon the location of the hemorrhage and the amount of brain damage.

- 1. Symptoms
- 2. The minor stroke may occur during sleep and be accompanied by:
 - (1) Headache.
 - (2) Confusion.
 - (3) Slight dizziness; ringing in the ears.
 - (4) Other mild complaints.
- d. Later, there may be:
 - (1) Minor difficulties in speech.
 - (2) Memory changes .
 - (3) Weakness in an arm or leg.

- (4) Some disturbance in the normal pattern of the personality.

2. First aid

- a. Protect the victim against accident or physical exertion.
- b. Suggest medical attention.

III. FAINTING

Fainting is a partial or complete loss of consciousness due to a reduced supply of blood to the brain for a short time. Occasionally, a person collapses suddenly without warning. Recovery of consciousness almost always occurs when the victim falls or is placed in a reclining position, although injury may occur from the fall. To prevent a fainting attack, a person who feels weak and dizzy should lie down or bend over with his head at the level of his knees.

A. Manifestations

Signs and symptoms are usually preceded or accompanied by-

- 1. Extreme paleness.
- 2. Sweating.
- 3. Coldness of the skin.
- 4. Dizziness.
- 5. Numbness and tingling of the hands and feet.
- 6. Nausea.

7. Possible disturbance of vision.

B. First aid

1. Leave the victim lying down.
2. Loosen any tight clothing and keep crowds away.
3. If the victim vomits, roll him onto his side or turn his head to the side and, if necessary, wipe out his mouth with your fingers, preferably wrapped in cloth.
4. Maintain an open airway.
5. Do not pour water over the victim's face because of the danger of aspiration; instead, bathe his face gently with cool water.
6. Do not give any liquid unless the victim has revived.
7. Examine the victim to determine whether or not he has suffered injury from falling.
8. Unless recovery is prompt, seek medical assistance. The victim should be carefully observed afterward because fainting might be a brief episode in the development of a serious underlying illness.

IV. CONVULSION

A convulsion is an attack of unconsciousness usually of violent onset. In an infant or small child, a convulsion may occur at the onset of an acute infectious disease, particularly during a period of high fever or severe gastrointestinal illness. Convulsions that develop later in the course of

measles, mumps, and other childhood diseases are more serious and might reflect complications of the central nervous system.

Convulsions associated with head injury or brain disease, such as a tumor, an abscess, or a hemorrhage, often tend to be localized, with rigidity and jerking of groups of muscles instead of the whole body.

A. Signs and symptoms

1. Rigidity of body muscles, usually lasting from a few seconds to perhaps half a minute, followed by jerking movements. During the period of rigidity, the victim may stop breathing, bite his tongue severely, and lose bladder and bowel control.
2. Bluish discoloration of the face and lips.
3. Foaming at the mouth or drooling.
4. Gradual subsidence.

B. First aid

1. Prevent victim from hurting himself.
2. Give artificial respiration, if indicated.
3. Do not place a blunt object between the victim's teeth.
4. Do not restrain him.
5. Do not pour any liquid into his mouth.
6. Do not place a child in a tub of water.

If repeated convulsions occur, call for medical help immediately or take the victim to a hospital.

V. EPILEPSY

A. Characteristics

Epilepsy is a chronic disease, usually of unknown cause, usually characterized by repeated convulsions "grand mal" seizures. The victim may be able to lie down quickly, or the family may be able to tell that an attack is beginning by the sudden paleness of his face or by his behavior. The usefulness of mouth to nose breathing in providing artificial ventilation for victims of grand mal seizure is effective.

Because of the high incidence of expiratory obstruction created by the soft palate, mouth to nose ventilation is the only effective way in which victims with such obstruction can be ventilated. The mouth-to-nose technique must be accomplished in such a way that the mouth is left open for exhalation. If the teeth cannot be separated, the lips should be parted to permit passive exhalation. Much research has been carried out on epilepsy in recent years, and excellent preventive treatment is available; for this reason, physicians should determine the type and cause of every episode of convulsion.

A milder form of epilepsy occurs without convulsions. There may be only brief twitching of muscles, "petit mal" seizures, and momentary

loss of contact with the surroundings. The victim may be seen staring fixedly at an object or off into the distance. This type of disturbance is less common than that which produces grand mal seizures.

B. First aid

First aid for epilepsy is the same as for other convulsions, with primary effort being made to prevent the victim from hurting himself.

1. Push away nearby objects.
2. Do not force a blunt object between the victim's teeth. (If the victim's mouth is open, you might place a soft object such as a rolled handkerchief between his side teeth.)
3. When jerking is over, loosen the clothing around his neck.
4. Keep him lying down.
5. Keep his airway open.
6. Prevent his breathing of vomit into the lungs by turning his head to one side or by having him lie on his stomach.
7. If breathing stops, give artificial respiration.
8. After the seizure, allow the victim to sleep or rest.
9. If convulsions occur again, get medical help.

VI. PREVENTION OF HEART ATTACK AND APOPLEXY

The following measures may help to prevent a heart attack as well as apoplexy:

1. Have a checkup every year after the age of 40.

2. Control weight.
3. Do not exercise strenuously if you are not used to it.
4. Get adequate rest.

Section 13

DRESSINGS AND BANDAGES

13.1 LEARNING GOAL: The student will have a working knowledge and psychomotor skills necessary to apply several types of bandages to specific injuries and areas of the body.

PERFORMANCE OBJECTIVE :

13.1.1 The student will, using a fellow student as a model, be able to demonstrate any of the following bandages: (1) arm sling, (2) triangular bandage for scalp and forearm injuries, (3) form a cravat out of a triangular bandage, (4) cravat for forehead, ear, or eye injuries, (5) cravat for knee and elbow, (6) cravat for cheek and ear injury, (7) how to anchor a bandage, (8) open and closed spiral turns, (9) proper methods to tie off a bandage, (10) a figure eight bandage for hand, wrist, knee, elbow or ankle. The student must demonstrate 8 of the 10 bandages for a passing score.

RESOURCE MATERIAL:

Techniques of applying dressings and bandages vary according to the extent and location of injuries, the material at hand, and the ability of the first aider to adapt to an emergency situation. Supplies can be obtained commercially for home use, or substitutes can be prepared from household linen. It may be necessary to improvise dressings and bandages from any woven fabric available, or even from facial tissues, other paper goods, or unused plastic bags. Fluff

cotton, which may be used to pad a splint, should never be placed directly upon an open wound, because the fibers are difficult to remove.

I. DRESSINGS

A. A dressing, also called compress, is the immediate protective cover placed over a wound. Sterile dressings are those free from germs prior to use and are preferable to unsterile dressings. If sterile dressings are not obtainable, a freshly ironed or laundered cloth, such as a handkerchief, towel, sheet, pillow case, or napkin may be used.

B. Functions

1. To assist in the control of bleeding.
2. To absorb blood and wound secretions
3. To prevent additional contamination
4. To ease pain

C. Sterilizing procedure

To sterilize dressings at home, wrap them in aluminum foil and place them in a moderate oven (350 F) for 3 hours, or boil them for 15 minutes and dry them without contamination. For immediate use, a clean cloth pressed with a hot iron or in the inner surface of a folded cloth will usually suffice. Do not touch, or breathe on or cough on the surface of a dressing that is to be placed next to a wound.

Use a dressing large enough to extend an inch or more beyond the edge of the wound. First, hold it over the wound and then lower it into place; do not slide it onto the wound from the side. If a dressing slips off onto surrounding skin before it has been anchored in place, discard it. Secure a dressing with bandages or tape, but do not wrap tape completely around the affected part, because blood vessels may be constricted as swelling occurs.

II. BANDAGES

A. Definition

A bandage is a strip of woven material used to hold a Wound dressing or splint in place. It helps to immobilize, support, and protect an injured part of the body. Occasionally, large pieces of cloth are used as bandages, as slings, and as binders.

B. Kinds

A bandage must be clean but need not be sterile. The most useful of those available commercially include:

1. Gauze bandages, usually in rolls of 10 yards 1, 2, or 3 inches wide.
2. Elastic bandages of woven material in various widths and lengths.
3. Triangular bandages, usually of muslin, approximately 55 inches across at the base and from 36 to 40 inches along the sides

(These bandages are included in first aid kits and are useful to cover large areas, as slings, and can be folded lengthwise as cravat bandages. They also can be folded into a thick pad for pressure over a wound to control hemorrhage. Triangular bandages are usually of muslin.)

4. A binder of muslin, to be applied to the chest or abdomen (A large towel or part of a sheet can substitute for a binder. A binder is rarely used except as an emergency bandage or dressing to cover a large area of the trunk, such as the chest or abdomen. It may be pinned in place or held with multiple ties or cravat bandages. Great care must be taken not to apply a binder so tightly that it interferes with breathing.

5. Other emergency bandages can be devised from handkerchiefs, household linen, belts, ties, socks, or stockings. Bandages can be held in place with adhesive, plastic or masking tape, safety pins, or clips. Gauze and muslin bandages can be split and tied.

III. COMBINATION DRESSINGS AND BANDAGES

Adhesive strips with an attached gauze dressing are available commercially in a wide variety of sizes and shapes. Another useful dressing bandage combination is the bandage compress, which is usually included in the supplies of a first aid kit. It consists of a pad made of several thicknesses of sterile gauze sewed to the middle of a strip of gauze or muslin. Bandage compresses are the most useful and efficient combination of bandage and dressing to apply to a large wound as an emergency cover.

The dressing portion provides bulk, over which pressure may be applied for control of severe hemorrhage.

IV. SPECIAL PADS

Large, thick layered, bulky pads with an outer waterproofed surface are available in several sizes for rapid application to an extremity or to a large area of the trunk. Because they are often used in the treatment of victims with circular burns, they are sometimes called "burn pads" or "general purpose dressings."

V. APPLICATION OF BANDAGES

A. General principles

1. A bandage should be snug (it is useless if too loose) , but not to tight as to interfere with circulation, either at the time of application or later if swelling occurs,
2. To ensure that circulation is not interfered with:
 - a . Leave the perons's fingertips exposed when a splint or bandage is applied to the arm, and leave the toes exposed when a splint or bandage is applied to the leg,
 - b. Watch for swelling, changes of color, and coldness of the tips of fingers or toes, indicating interference with circulation.
 - c. Loosen bandages immediately if the victim complains of a numbness or a tingling sensation.

- d. Never apply a tight circular bandage about a person's neck; it may cause strangulation.

B. Elastic bandages

Although they are the easiest of all bandages to apply and are especially useful since they conform more readily to the injured part than gauze or muslin, they are the most hazardous because of the tendency of the first aider to stretch them so much that circulation or nerve function may be impaired. They are rather expensive but can be laundered and used separately for a number of purposes.

In using elastic bandages, the first aider must take great care not to stretch the material too tightly.

C. Gauze bandages

1. Application

Skill is necessary in applying a gauze bandage to prevent its slipping and stretching, because gauze is very loosely woven. Never apply a wet gauze bandage. It will shrink as it dries and become too tight. Gauze can be used to bandage almost any part of the body. Choose the appropriate width.

2. Most common uses.

- a. Circular bandages
- b. Spiral bandages
- c. Figure eight bandages (for joint areas)

d. Fingertip bandages (formerly called recurrent)

D. Triangular bandages

Triangular bandages are useful as an emergency cover for the entire scalp, the hand or foot, or any large area. Such a bandage also is used as a sling for fracture or other injury of the arm or hand.

Folded into a cravat bandage (cravat means necktie), the triangle can be used as a circular, spiral, or figure eight bandage; it can be used, also, as a tie for a splint, as a constricting band, and as a tourniquet. If the cravat bandage is folded several times again to form a thick pad, it can serve as an emergency dressing for control of bleeding or can be placed over another dressing to provide protection and pressure.

E. Adhesive strip dressings

Adhesive-strip dressings or homemade substitutes are used for small wounds following thorough cleansing. Blot the surface dry before applying the tape, and for a cut, hold the edges of the wound together as the dressing is secured in place.

F. Methods of applying bandages

1. Arm sling

Prepare a triangular piece of cloth approximately 55 inches across the base and from 36 to 40 inches along the sides. Regular triangular bandages of this size may also be purchased in unit packages.

- a. Place one end of the bandage over the uninjured and let the other end hang down in front of the chest, parallel to the side of the body.
- b. Carry the point behind the elbow of the injured arm.
- c. Carry the second end of the bandage up over the shoulder and tie the two ends together at the side of the neck-not over the spine.
- d. Bring the point of the bandage forward and pin it to the front of the sling.
- e. If a pin is not available, twist the point of the bandage until it is snug at the elbow and tie a single knot.
- f. Make sure that the ends of the fingers extend just beyond the base, so that you can observe whether or not the circulation is cut off.
- g. In all cases of injury to the hand or lower forearm, adjust the sling so that the hand is elevated 4 or 5 inches above the level of the elbow.

2. Triangular bandage folded as a cravat

To make a cravat, bring the point of a triangular bandage to the middle of the base. Then fold lengthwise along the middle until you obtain the desired width.

3. Triangular bandage for the scalp and forehead

Fold a hem about 2 inches wide along the base. Place compress. Put the dressing in place with the hem on the outside, place the bandage on the head so that the middle of the base lies on the forehead close down to the eyebrows and the point hangs down the back. Carry the two ends around the head above the ears and cross them just below the bump at the back of the head. Draw the ends snugly, carry them around the head, and tie them in the center of the forehead. Steady the head with one hand and with the other draw the point down firmly behind to hold the compress securely against the head. Pick up the point and tuck it in where the bandage ends cross or pin it down with a safety pin at the back of the head.

4. Cravat bandage for forehead, ears, or eyes

Place the center of the cravat over the compress that covers the wound. Carry the ends around to the opposite side of the head and cross them. Bring them back to the starting point and tie them.

5. Cravat bandage for cheek or ear

Use a wide cravat. Start with the middle of the cravat over the compress that covers the cheek or ear. Carry one end over the top of the head and the other under the chin. Cross the ends at the opposite side, bringing the short end back around the

forehead and the long end around the back of the head. Tie them over the compress. Never use the method for fracture of the jaw or where there is bleeding in the mouth or danger of vomiting, unless an attendant will be constantly present to loosen the bandage in an emergency.

6. Cravat bandage for elbow or knee

Bend the elbow or knee at a right angle unless this movement produces pain. Use a rather wide bandage. Start with the middle of the bandage over the dressing at the elbow. Carry the ends around in opposite directions—one end around the upper arm or leg and the other end around the lower part, crossing them in the hollow. Continue around, covering the dressing, back to the hollow and tie to the outside.

G. Anchoring a bandage

1. Place the end of the bandage on a bias at the starting point.
2. Encircle the part, allowing the corner of the bandage end to protrude.
3. Turn down the protruding tip of the bandage and encircle the part again.

H. Tying off a bandage

Another method to tie the gauze or muslin in place is as follows:

Take the bandage end in a direction away from the body part being

covered; loop around the thumb or finger and continue back to the opposite side of the body part; encircle the part with the looped end and the free end and tie.

I. The circular turn

Circular turns simply encircle the part with each layer of bandage superimposed on the previous one. It is simplest of all bandage turns. However, its use is limited to covering parts of uniform width, such as the toe and head.

J. Open and closed spiral bandage of the limb

Begin by anchoring as previously described; continue to encircle the area to be covered by the use of spiral turns spaced so that they do not overlap; complete the bandage by tying off. This bandage may be useful as a temporary bandage, for splinting, and when used to hold a large burn dressing in place. It may be closed (closed spiral) simply by continuing to encircle with spiral turns until all gaps are closed.

K. Figure eight bandage for hand and wrist

Anchor the bandage with one or two turns around the palm of the hand. Carry it diagonally across the front of the wrist and around the wrist. Again carry it diagonally across the front of wrist, and back to to the palm. This figure eight maneuver is repeated as many times as is necessary to fix the dressing properly. Complete by tying off.

L. Fingertip bandage

This is a series of back and forth turns called recurrent turns, held in place by circular and spiral turns, and secure by tying it off. Normally used to bandage fingers, the bandage may be adapted to bandage the toes, scalp, or stumps of limbs. When areas such as the scalp are to be covered, the next fold covers the opposite side of the part being covered, and each succeeding fold is worked toward the center until the area is sufficiently covered. This bandage is held in place with circular turns.

Another method of securing this fingertip bandage is to use the figure eight turn to complete its application. From the finger, or toe, take the end of the bandage diagonally across the back of the hand to the wrist; encircle one or more times; from the opposite side of the wrist, continue to the finger and loop. Repeat the figure eight several times and tie off at the wrist.

M. Figure eight bandage for the ankle

Anchor the bandage on the instep and take two or three additional turns around the instep and foot. Carry the bandage diagonally upward across the front of the foot, then around the ankle and diagonally downward across the front of the foot and across under the arch. Make several of these figure eight turns, each turn overlapping the previous one by about two-thirds the width of the bandage. Occasionally, use an extra turn around the ankle complete by tying off.

VI. FIRST AID KITS AND SUPPLIES

From your study of first aid you have learned how to improvise a number of bandages, dressings, and splints. It is, of course, more satisfactory to have sterile dressings, prepared splints, and other first aid equipment ready for use before an accident occurs.

There are two general types of first aid kits: (1) the type and (2) the cabinet type.

A. Unit-type kits

Unit-type kits have a complete assortment of first aid materials put up in standard packages of unit size or multiples of the unit size and arranged in cases containing 16, 24, or 32 units, with the 16 and 24 unit kits being the most popular. Each unit package contains one or more individual dressings. Each dressing is complete in itself and is sealed in a sterile wrapper. It contains just enough material to treat a single injury, thus eliminating waste. All liquids are put up in individual, sealed ampules, and consequently cannot deteriorate.

There are no bottles to spill or break.

Illustrations and instructions for the use of the contents are on the front of each package. The desired unit packages are easy to locate, because the contents are clearly indicated on the top side in bold type. The unit packages fit like blocks in the case; they cannot shift or become disarranged. These types of kits are probably the most satisfactory for carrying in a car or truck or in a pack.

Standard refills are supplied by various manufacturers and can be changed easily to meet the needs of the purchaser. Unit refills are easy to obtain. The original cost may be slightly higher, but when materials are subject to much handling by many different persons, this type is generally cheaper and more satisfactory in the long run. There is no contamination or waste of unused materials. The kits can be obtained with contents selected to meet the particular needs of the purchaser.

1. Contents of 16-unit first aid kit

2 units--1" adhesive compress

2 units--2" bandage compress

1 unit --3" bandage compress

1 unit --4" bandage compress

1 unit --3" x 3" plain gauze pads

1 unit --gauze roller bandage

2 units--plain absorbent gauze--1/2 sq. yd.

2 units--plain absorbent gauze--24"x72"

3 units--triangular bandages--40"

1 unit --tourniquet, scissors, tweezers

2. Contents of 24-unit first aid kit

2 units--1" adhesive compress

2 units--2" bandage compress

2 units--3" bandage compress

2 units--4" bandage compress

1 unit --3" x 3" plain gauze pads

2 units--gauze roller bandage

1 unit --eye dressing packet

4 units--plain absorbent gauze--1/2 sq. yd.

3 units--plain absorbent gauze--24"x72"

4 units--triangular bandages.--40"

1 unit --Tourniquet, scissors, tweezers

B. Cabinet type Kits

Cabinet kits are made for a wide variety of uses and range in size from pocket versions to large industrial kits. They are made to accept packages in different shapes and sizes. Contents may be varied by the purchaser to suit his particular first aid needs. The extra space in most cabinet kits also allows additional items to be inserted according to user's needs.

Cabinet kits contain a large enough supply of most first aid items to be used for more than a single treatment. However, all sterile materials are individually wrapped.

Cabinet kits carry familiar first aid items that are easily recognized in an emergency. Although the different size packages allow for some shifting of products in transported kits, they have the advantage of a functional package design that does not waste unnecessary space.

Refills are obtainable from most drugstores or through safety equipment distributors.

C. Other kits

Kits can be either purchased or can be assembled from improvised materials. All kits, whether purchased or improvised, are satisfactory if the following points are observed in their selections:

The kit should be large enough and should have the proper contents for the place where it is to be used

The contents should be arranged so that the desired package can be found quickly without unpacking the entire contents. Material should be wrapped so that unused portions do not become dirty through handling.

Types and sizes of kits to meet specific needs should be selected and supplied with items recommended by consulting physician.

Section 14

BONE AND JOINT INJURIES

14.1 LEARNING GOAL: The student will develop the knowledge of basic definitions and classifications of extremity injuries and their hazards.

PERFORMANCE OBJECTIVE:

14.1.1 The student will define and list all classifications of fractures, dislocations, sprains and strains.

14.2 LEARNING GOAL: The student will be expected to know the signs and symptoms of fractures, dislocations, sprains and strains.

PERFORMANCE OBJECTIVE :

14.2.1 The student will list the signs and symptoms for fractures, dislocations, sprains and strains.

14.3 LEARNING GOAL: The student will develop the psychomotor skills necessary to apply splints to various injuries.

PERFORMANCE OBJECTIVE:

14.3.1 The student will demonstrate to the instructor's satisfaction the proper splint for an injury to the upper arm, forearm, wrist, thigh, knee, lower leg, ankle and foot.

RESOURCE MATERIAL :

I. DEFINITIONS

Multiple injuries to the skeletal system, including the bones, joints, and ligaments, and to the adjacent soft tissues are common in all types of major accidents.

A. Fracture

A fracture is a break or crack in a bone.

1. Closed fractures

Closed (or simple) fractures are those not related to open wounds on the surface of the body, although there may be a laceration over or near the fracture site.

2. Open fractures

Open (or compound) fractures are those associated directly with open wounds. An open fracture may result from external violence or may be produced by injury from within as broken ends of a bone protrude through the skin at the time of the accident or later through motion or mishandling of the fractured bone.

B. Dislocation

A dislocation is an injury to the capsule and ligaments of a joint that results in displacement of a bone end at a joint.

C. Fracture dislocation

A fracture dislocation is a dislocation associated with a fracture.

D. Sprain

A sprain is an injury to a joint ligament or a muscle tendon in the region of a joint. It involves the partial tearing or stretching of these structures, injuries to blood vessels, and contusions of the surrounding soft tissue without dislocation or fracture.

E. Strain

A strain is an injury to a muscle that results from overstretching. It may be associated with a sprain or a fracture.

II. FRACTURES

A. Causes

1. Trauma related fractures
2. Accidental injury and fractures

B. Signs and Symptoms

If an accident victim is conscious he will usually be able to provide clues to possible fractures. He may recall his position before the injury and relate what happened as he fell or struck some object. In addition:

1. Information available from victim:
 - a. He may have heard or felt a bone snap.

- b. He may indicate the location of pain and tenderness and difficulty in moving the injured part.
- c. He may also report a grating sensation of broken bones rubbing together.
- d. He may report abnormal or false motion in an area of the body.

2. Other signs of fracture include--

- a. Differences in the shape and length of corresponding bones on the two sides of the body.
- b. Obvious deformities
- c. Swelling
- d. Discoloration
- e. Pain or tenderness to touch

3. Closed fractures

Closed fractures are much more common than open fractures.

As a rule, accurate diagnosis can be made only by a physician with the assistance of X-ray examination. The first aid worker should suspect that a bone is broken when any of the signs are present.

Even if there is a doubt, to prevent aggravation of existing injuries, he should carry out first aid measures for a fracture.

4. Open fractures

In an open fracture, the wound usually is caused by a broken bone end that tears through the skin and, in most cases, slips back again. Sometimes the wound is caused by machinery or by a missile, such as the bullet that penetrates the skin and breaks the bone. Open fractures are much more serious because of tissue damage and bleeding and the danger of infection because the fracture area is always contaminated.

C. Objectives

1. To provide all necessary first aid care.
2. To keep the broken bone ends and the adjacent joints from moving.
3. To give care for shock.

D. First aid principles

1. To maintain an open airway and apply artificial respiration if indicated.
2. To rescue, if necessary, and to protect against further injury.
3. To call for an ambulance, if indicated, or medical assistance.
4. To prevent motion of the injured parts and the adjacent joints.
5. To elevate extremities, if possible, without disturbing the suspected fracture.

6. To apply splints, if modern ambulance service is not available, if there is a delay in transportation, or in less serious injuries before seeking medical assistance for diagnosis and treatment.

Do not attempt to set (or reduce) a fracture or try push a protruding bone end back.

If splinting and transportation are necessary, the bone end may slip back when the limb is straightened for splinting.

If an ambulance or rescue squad can arrive within a period after an accident, when an injured person requires hospitalization, do not attempt to move the victim unless there is danger of fire, carbon monoxide poisoning, explosion, drowning, or other life-threatening emergencies. Above all, in attempting rescue, do not drag victim out of vehicles, or from under wreckage, or throw them on the ground in your haste to save their lives.

If possible, even in the midst of a crowded street or highway, take the time to tie a victim's injured leg to his uninjured one, or bind his injured arm to his chest or side.

Lift and move an unconscious victim as though there is injury to his neck or spine.

Wait for adequate help at least three and probably four persons and obtain a rigid support for the victim's back, if possible.

Following a neck or spinal injury during water activity, float the victim to shore without bending his neck or back. Do not lift the victim out of the water without a back support.

Delegate others to telephone for an ambulance and the police, if necessary, and to assist in maintaining order in the area of the accident,

If an open fracture is evident or suspected, treat the wound as outlined previously:

- a. Remove or cut away the victim's clothing.
- b. Control hemorrhage by applying pressure through a large sterile (or clean) dressing over the wound.
- c. Do not wash the wound, do not probe it, and do not insert your fingers into it.
- d. If a fragment of bone is protruding, cover the entire wound with a large, sterile bandage compress or pads; if these are not available, use freshly laundered sheets or towels.
- e. Do not replace bone fragments.

Apply splints, as described below, according to the location of the fracture. Then elevate the limb slightly to reduce hemorrhage and swelling. Open fractures should have priority over closed

fractures for transportation and medical treatment, unless associated injuries dictate otherwise.

E. Splinting

Splints are devices applied to the arms, legs, or trunk to immobilize the injured part when a fracture is suspected. They decrease pain and the likelihood of shock by preventing motion of the broken bone ends and the adjacent joints. They also protect against further injury during transportation for medical treatment.

1. There are many types of splints available commercially.

However, very satisfactory emergency splints can be made from corrugated cardboard, newspapers, boards, straight sticks, rolled-up blankets, pillows, etc. A simple splinting technique in an emergency is to tape or tie the injured leg to the uninjured one-with padding between, if possible; or to bind an injured arm, after padding, to the chest if the elbow is bent, or to the side if the elbow is straight.

2. The splint should be long enough to extend past the joints on either side of a suspected fracture.
3. The splint should be adequately padded between the splint and the skin, especially over bony places.

The ends of board splints should also be well padded unless they extend beyond the body.

4. Splints may be held in place by strips of cloth torn from skirts or other material, large handkerchiefs, neckties, cravat bandages, or other similar material.
5. Joints should be immobilized above and below the location of the suspected fracture.
6. In fractures of the arm, check the pulse in the wrist and inspect the fingers frequently for swelling or bluish discoloration, which is a good indication that the bandages are too tight.
7. If the victim complains of numbness, tingling sensations, or inability to move his fingers or toes, loosen ties immediately-otherwise, permanent nerve damage may result. If splints are used in fractures of legs or feet and these symptoms appear, loose the bandages, remove the victim's shoes and hose, and examine his toes repeatedly for color changes or swelling. If these signs appear, it may be necessary to further loosen bandages and reapply them.
8. It is important to remember that a person often can move parts below the break with little or no pain. It is also important to remember that he should not move the injured part.
9. Never test for fracture by having the victim move the part or try to walk on a possibly broken leg.
10. Do not allow an accident victim to move his head (or do not move it yourself) when there is a possible neck or spine injury.

Movement may cause further damage to the spinal cord and result in paralysis.

11. If it is necessary to straighten and splint a deformed limb, proceed as follows:

- a. Place one hand above and one below the fracture to support it.
- b. Give care for shock.
- c. For fracture of the leg, have someone grasp the end of the limb and pull gently and steadily until splints are applied.
- d. Apply Splints.

III. SPECIFIC FRACTURES

A. Shoulder

1. Fracture of the scapula

A fracture of the scapula (shoulder blade) is generally the direct result of the impact of a fall or an automobile collision. Dislocations of the shoulder joint, sprains, and contusions are common in this area. First aid consists of applying a sling and bandaging the victim's upper arm to his chest wall.

2. Fractures of the clavicle

Fractures of the clavicle (collarbone) usually occur in the weakest portion, which is one-third of the distance from the tip of the shoulder to the sternum. These fractures are particularly common with children and ordinarily heal without complication in 2 or 3 weeks (twice as long with adults). First aid consists of applying a sling to elevate the victim's arm and shoulder blade, which fall because of the loss of support from the clavicle, and then binding the arm to the victim's chest.

B. Humerus (the bone in the upper arm)

1. First aid for a closed fracture

Place a pad in the victim's armpit, apply a splint or improvised splint, tied in place above and below the break area, and support his forearm with a sling that does not produce upward pressure at the fracture site. Bind the victim's upper arm to his chest wall.

2. First aid for an open fracture

Cover the wound with a large sterile, or clean, dressing and apply a splint that does not press against the area of the break. Do not attempt to cleanse the wound.

In the absence of a splint, support the victim's arm with a sling and bind it to his chest with an encircling bandage.

3. Immobilization

Remember that the three places to immobilize a fracture (or suspected fracture) of the upper arm are-

- a. Broken bone ends
- b. Shoulder
- c. Elbow

C. Elbow

1. Location

Elbow fractures may involve the lower part of the humerus or the bones of the forearm.

2. First aid

- a. Place the victim's forearm in a sling and bind it to his body. If the fracture occurred with the elbow straight, do not attempt to bend it to apply a sling. After placing a protective fold of cloth in the victim's armpit, secure a well-padded splint along both sides of the entire arm with ties.

- b. Have the victim lie down and elevate his arm.

C. If a splint is not available, wrap a pillow about the arm, centering it at the elbow, and tie or pin the two sides together.

D. Forearm and wrist

1. Bones involved

The two bones of the forearm (ulna and radius) may be fractured individually or together.

2. First aid

Fractures in the midportion of the forearm and wrist are treated in the same way as fractures of the shaft of the humerus.

- a. Immobilize the broken bone ends, the wrist and the elbow, by applying well-padded splints on each side.
- b. Bend the elbow and apply a sling with a slight elevation, keeping the thumb pointing upward.

E. Upper leg

1. Causes and characteristics

Fractures of the shaft of the femur usually result from falls or traffic injuries. The victim is in severe pain and shock as a rule, and markedly disabled. The foot is characteristically turned outward and the limb shortened owing to overlapping of the bone ends due to muscular spasm.

2. First aid

- a. If the victim is to be transported only a short distance on a stretcher, place a blanket between the legs and bind them together.
- b. If you use improvised board splints, they should be well padded and should reach from the victim's armpit on the outer side and groin on the inner side to below his heel.
- c. To apply the board splint, assemble needed supplies.
Push the cravat bandages (or strips of cloth) under the victim at the body angles of the ankle, the knee, and the lower back. Slide bandages into place. Place padded splints in position.

Place additional padding at the knee and ankle. Complete by making snug ties on the outer splints.

- d. If an open wound is present, do not attempt to cleanse it. Cover it with a sterile or clean bulky pad after cutting away contaminated clothing, apply pressure through it to control bleeding, secure the dressing in place, and splint.
- e. If at all possible, a traction splint should be applied at the scene of the accident for fractures of the shaft of the femur. This splint will provide the best fixation of the fracture and will make the victim comfortable.

However, only persons with specific training in the application of traction splints should attempt to apply the splint.

F. Kneecap

1. Causes and characteristics of fracture.

The patella, or kneecap, is in front of the knee joint. It is fractured usually by a direct blow or in injuries sustained when control of the knee is lost, with the front thigh muscles pulling violently on the kneecap.

2. Apply a pillow splint about the knee or padded splints from below the victim's heel to his buttocks along the back of the leg, with the leg extended.

G. Lower leg

1. Description

The bones of the lower leg are the tibia, or shinbone, which supports the weight of the body, and the fibula, which forms the outside wall of the ankle and is on the outer side of the leg.

2. First aid for fractures of the tibia and fibula

a. Apply well-padded splints on both sides of the leg and foot.

- b. In an emergency, insert blankets or towels between the legs and tie them together.

C. Remember to keep the victim's foot pointing upward, and check constantly to make sure that bandages do not interfere with the circulation to the lower leg and foot. Prevent movement of the broken bone ends, knee, and ankle.

H. Ankle and foot

1. Description and causes

The ankle is made up of the lower ends of the tibia and fibula, and the first bone of the foot (the talus). Fractures in this area occur most commonly in active sports, in falls, and in motor vehicle accidents.

2. First aid

- a. Loosen or remove the victim's shoes, and keep him lying down with his leg elevated.
- b. For an open wound, apply large, bulky dressings, sterile if possible.
- c. Splint with a pillow or blanket firmly applied, without attempting to correct the deformity.

I. Spine

The backbone, or spinal column, is composed of 33 bones called vertebrae. The backbone encases the spinal cord, which passes

through circular openings in the separate vertebrae. If a vertebrae or disk is fractured or dislocated, the spinal cord may be injured. Fractures of the neck or back are extremely dangerous, because the slightest movement may cause further damage to the spinal cord and result in paralysis.

1. First aid for fracture of the neck

- a. Do not allow the victim's head to be bent forward or backward, or to move from side to side. If the victim is having breathing difficulty, rescuers must follow the steps of airway control, the only modification being that head tilt should be minimal and forward displacement of the mandible and positive pressure breathing should be accomplished first if indicated.
- b. If the victim is lying on his back, a small pad or towel may be placed in the space under his neck. (Do not put a pillow under his head.)
- c. Place rolled up clothing, blankets, or sandbags around the victim's head, the sides of his neck, and his shoulders to prevent movement.
- d. Anchor the restraining materials with bricks or stones, if available.
- e. Seek medical advice, and send for an ambulance with trained personnel.

2. First aid for fracture of the back

- a. Handle as little as possible
- b. Send for an ambulance
- c. Until help arrives, leave the victim in the position in which he was found, and unless there is delay in transportation of his condition is critical, take care of all other emergencies, such as breathing difficulty, hemorrhage, and open wounds, and apply dressings and splints as necessary.
- d. Do not twist the neck or back.
- e. Arrange rolled-up blankets or clothing on both sides of the trunk, head, and neck for immobilization.
- f. If a person with a fracture (or suspected fracture) of the back must be turned to obtain an open airway (for example, if he is face down in mud or water), make sure to obtain enough help so that the entire body is turned as a unit and no part twists or turns faster than other parts. Whenever possible, keep the victim in the position in which he was found.

IV. DISLOCATION

A dislocation is a displacement of a bone end from the joint, particularly at the shoulder, elbow, fingers, or thumb, usually as

result of a fall or a direct blow. Unless given proper care, a dislocation may occur repeatedly.

A. Signs of dislocation

1. Swelling
2. Obvious deformity
3. Pain upon motion
4. Tenderness to touch
5. Discoloration

B. First aid

First aid should be essentially the same as for closed fractures:

1. Splint and immobilize the affected joint in the position in which it was found.
2. Apply a sling, if appropriate. Elevate the affected part, if a limb is involved.
3. Seek medical attention promptly.
4. Never attempt to reduce a dislocation, or to correct any deformity near a joint, since often extensive tearing of the joint capsule has occurred. Careless handling may cause additional tearing of supporting structures, and, at the same time, may injure blood vessels and nerves in the area.

V. SPRAINS

A sprain is an injury to the soft tissue surrounding joints, usually as a result of forcing a limb beyond the normal range of a joint. The ligaments, muscles, tendons, and blood vessels are stretched or torn. The ankles, fingers, wrists, and knees are most often sprained.

A. Signs of sprain

1. Swelling
2. Tenderness
3. Pain upon motion
4. Discoloration

It is usually impossible to tell a sprain from a closed fracture without an X ray. Small chip fractures often accompany the tissue injuries of a sprain.

B. First aid

1. If the victim's ankle or knee is affected, do not allow him to walk.
2. Loosen or remove the victim's shoes, apply a pillow or blanket splint and elevate the victim's leg, because swelling may produce greater disability than the original injury itself.
3. In mild sprains, keep the injured part raised for at least 24 hours. (Do not soak in hot water.)

4. Apply cold, wet packs or place a small bag of crushed ice on the affected area, over a thin towel to protect the victim's skin. Packs may be applied over a period of several days. (Do not pack the joint in ice, and do not immerse the injured limb in water that contains ice.)
5. If swelling and pain persist, seek medical attention.

VI. STRAINS

A. Description and cause

Strains are injuries to muscles from overexertion. The fibers are stretched and sometimes partially torn. Back strains are commonly caused by improper lifting. (A person should lift with his legs and not his back.)

B. First aid

1. Bed rest, and use of a board under the mattress for firm support is recommended for a person with a strained back.
2. Other strains are cared for by application of , warm, wet applications, and rest.
3. Medical care (All severe back strains should be seen by a physician.)

VII . PREVENTION OF SKELETAL AND MUSCULAR INJURIES

When an impact force between any part of the body and some physical object is strong enough to overcome the structural strength

of underlying bone, the bone either breaks or cracks. As in the case of wounds, impact forces that produce fractures involve motion of either man, a physical object, or both man and object.

Motor vehicle accidents and falling accidents are a major source of bone and joint or muscle tissue injury. Collision with fixed or other moving objects while engaged in such activities as running, skating, skiing, or cycling is also a common cause of fractures.

Prevention of skeletal and muscle tissue injuries requires that the source, direction, and amount of destructive impact forces be eliminated, controlled, or avoided. Many of the same conditions and activities that produce wounds, and the measures discussed in preventing wounds, are applicable to the bone, joint, and muscle accident problem.

The following discussion on prevention will limit itself to additional considerations regarding motor vehicle accidents, the more common conditions that may create falls, and those personal practices that help a person to avoid dislocations, sprains, and muscle strains.

A. Motor vehicle accidents.

The death and bodily destruction caused each year in the United States by motor vehicle accidents presents what should be an intolerable situation for a civilized society. Almost half of all accidental deaths result from accidents that involve a motor vehicle.

Essentially, the problem is one of people, and its solution is the responsibility of people. A Red Cross course in first aid, with emphasis on accident prevention, will stimulate your thinking and should motivate you toward constructive action for greater highway safety and accident prevention. What follows is intended to provide a basis for discussion of the overall highway accident problems.

1. Driving skill and judgment

Driving skill and judgment cannot be separated; both are equally important in preventing accidents. Driving skill determines the ability of an individual to exercise physical control of a motor vehicle under normal as well as abnormal traffic, road, environmental, and other driving conditions. Driving judgment governs the ability of a driver to anticipate or recognize a potential accident condition or activity and to know what correction or evasive action can and must be taken to avoid an accident.

The effective exercise of both skill and judgment, however, is dependent upon the driver's attitude toward accident prevention. The motor vehicle driver who periodically ignores or simply refuses to accept responsibility for his own safety or the safety of others is, in reality, a licensed hazard to life and limb. Everything begins with attitude.

2. Vehicle condition

Like the human body, any machine is also subject to malfunction, occasionally needs remedial care, and should be given periodic checkups. A motor vehicle is a mass of moving parts, chambers, tubes, wires, electrical components, linkage, etc. , that is subject to malfunction from friction, heat, chemical action, deterioration, and natural wear .

Since breakdown or malfunction of the vehicle can result in broken bones, bleeding wounds, or death, make certain that it is kept in good running condition. Follow the schedule of preventive maintenance suggested in your owner's manual . Learn to recognize sounds, odors, and vibrations that may be symptomatic of possible trouble. Check tires, windshield wipers, horn, and lights, frequently; if defective, have them repaired or replaced immediately. Have a qualified automotive mechanic regularly inspect such items as brakes, wheel alignment, steering mechanism and linkage, and hydraulic, suspension, and exhaust systems.

3. Condition of the driver

Another contributing factor in motor vehicle accidents is the condition of the driver. As the nation's highways become more crowded, greater driving skill and judgment become necessary. Any condition that interferes with the normal skill and judgment of a driver increases the accident

potential. Avoid any practice that may dull the senses, impair reaction time, or cloud mental alertness. Do not, for example, drive after drinking alcohol or after taking drugs that may cause you to become drowsy. Persons in a state of emotional tension or anxiety present a very dangerous accident hazard to themselves and others should not be behind the wheel. Sources of distraction and irritability, such as radio, over-active children, and the "backseat driver," should be kept under control. Fatigue is often a contributing factor in accidents. Take frequent rest stops on a long trip; and if fatigue impairs your alertness at any time, pull off the road and take a rest. Confirmed conditions also require corrective action; if you need glasses for driving, wear them.

4. Environmental conditions

Environmental conditions of snow, sleet, rain, fog, and darkness increase the danger of motor vehicle accidents occurring. Each of these conditions restricts visibility in varying degrees. Snow, sleet, and rain present the additional hazard of less than normal tire traction for controlling and stopping the vehicle.

Speed and distance between vehicles must be adjusted to prevailing conditions. On slippery streets or road, avoid hard, sudden braking, use a lower transmission gear so that the motor can help to slow the vehicle down, and if the brake

must be used, pump it gently. Snow tires, chains, tire studs, and other gripping devices enhance control of a vehicle on snow-or ice-covered roads. Remember also to keep the windshield clean, and other windows as clear of ice and snow as possible.

5. Pedestrian safety

About two-thirds of all pedestrian accident fatalities and injuries occur to people crossing over or entering upon streets. Drivers, therefore, should exercise special caution near schools, churches, playgrounds, parking lots, pedestrian crosswalks, and on narrow residential streets where someone may walk into the path of a moving vehicle from behind a parked car.

Pedestrians can protect themselves by crossing streets only at intersections or marked crosswalks and by obeying traffic signals. If there is no sidewalk, stay on the left and walk facing traffic. At night, wear or carry something white; strips of reflecting tape on a raincoat help a driver to see you when inclement weather obstructs normal visibility.

B. Falling accidents

Falls are the second leading cause of accidental death, ranking behind motor vehicle fatalities and ahead of fire and burn fatalities. About three out of every four deaths from falls happen to people 65

years of age or older. The majority of accidental falls occur in the home environment.

C. Slipping and tripping hazards

Wipe up spilled liquids on kitchen, bathroom, or other bare floor surfaces as soon as noticed. Use a nonslip floor wax. Make certain that small rugs are secured in some way and keep them away from the top and bottom of a stairway. Clean snow off steps and sidewalks, and use salt or sand on icy walk area. Place a safety mat in the bathroom tub, or better yet, install handholds. Be careful of any play or work in wet grass, particularly if the work involves pushing a power mower.

Torn sections and rolled up edges of carpets present a common tripping hazard. Brooms, vacuum cleaner hoses, small footstools, toys, tools, and similar objects left haphazardly on floors or stairs are all obstacles. Stairs should be well lighted, carpets or stair treads kept in good repair, and handrails installed for their entire length. Carelessly mislaid toys, garden tools, and other objects hidden in grass, or holes dug by children and animals present tripping hazards out of doors. Pegs and wires holding up young trees and shrubs create a hazard as well.

D. Climbing and reaching

Makeshift devices such as chairs or boxes provide an unsafe substitute for a sturdy stepladder. Reposition a ladder instead of

taking a chance of overreaching. As a rule, keep your hips between the ladder rails. Use both hands when climbing a ladder, and face the ladder when climbing up or down. Make necessary arrangements for hoisting tools or paint before leaving the ground.

Ladder rails and rungs should be inspected before use. Because paint hides structural defects, do not paint ladders. A straight ladder should be firmly based, with its foot a quarter of the ladder length away from the wall. It is usually best to have a qualified expert do work involving considerable height, such as installing a television antenna. If you must perform any roof operations, use a safety belt and strong rope.

E. Special precautions

Remember, falls are the leading cause of accidental death and injury to older people. Older persons should avoid sudden head or body movements that may cause them to lose balance and should slow down when moving about from place to place. Stairs are particularly dangerous, since the balance, agility, and visual acuity and perception of older people are not as great as in youth.

One of the most frequent causes of physical injury to infants is falling from tables and bassinets. Make certain that infants are not left unattended in places where they might fall, even for a moment.

F. Joint and muscle tissue injury prevention

Dislocations result from too much stress on a joint. Injury producing conditions are similar to those causing fractures, and the same type of prevention considerations can serve to eliminate, control, or avoid dislocations. Sprains overstretch or tear either the ligaments of a joint or muscle tendons from their attachment to the skeleton.

Weight thrown forcibly upon a joint, or sudden force that causes the joint to turn or twist from its normal range of movement, are common causes. While proper strapping or taping prior to participation in athletic activities help control the incidence of such injuries, the frequency of ankle and knee joint injuries in some sports serves to point up man's limited capabilities for preventing tissue and capsule injury to these points. Head restraints in automobiles offer some measure of protection against neck sprains, commonly called "whiplash" injuries, which result from rear-end vehicle collisions.

Muscle strains most frequently involve the back muscles, and are usually the result of lifting too much weight, or lifting a heavy weight improperly. To avoid back strain when a heavy object must be lifted, observe the following precautions:

Plant the feet firmly and apart.

Squat do not lean forward, keeping the back as straight as possible, and get a good grip on the object.

Lift slowly, pushing up with the strong thigh and leg muscles.

Do not jerk the object upward or twist the trunk of your body as lifting takes place.

To lower a heavy object, reverse the above procedure.

Section 15

EMERGENCY RESUE AND SHORT DISTANCE TRANSFER

15.1 **LEARNING GOAL:** The student given this module be familiar with the basic definitions, indications, classifications, and methods of immediate rescue and transfer.

PERFORMANCE OBJECTIVE:

15.1.1 The student will define rescue and transfer and list those indications and methods to be used in immediate rescue and transfer.

15.2 **LEARNING GOAL:** The student will possess the basic knowledge and psychomotor skills to perform specific lifts, carrying methods used during rescue and transfer.

PERFORMANCE OBJECTIVE:

15.2.1 The student will demonstrate to the instructor's satisfaction the methods used in pulling a victim, the chair carry, fore-and-aft carry, two and four handed seat carry, placing a victim on a blanket, three-man hammock carry and the proper use of a stretcher.

RESOURCE MATERIAL:

Emergency rescue and transfer deal with the movement of victims away from hazardous locations and the use of protective methods to support a victim's body during emergency transfer.

Involvement of the first-aider in emergency rescue and transfer is limited to situations in which professional ambulance or rescue personnel and equipment are not or will not be available, to assisting those professionals when they are available, and to removing victims when there is immediate danger to their lives.

If a person is ill or injured to the extent that he will require transport to a medical facility, the first decision to be made by the first-aider is whether it is necessary for the victim to be transferred a short distance before being placed on a litter and in an ambulance.

Unless there is immediate danger to the life of the victim from such hazards as those listed below, he should not be transferred until such life-threatening problems as airway obstruction and hemorrhage are cared for, wounds are dressed, and fractures are splinted.

It should be recognized that more harm can be done through improper rescue and transportation than through any other measures associated with emergency assistance. In the majority of situations, rescue from confinement or pinning should be carried out by ambulance or rescue personnel. Pending their arrival, the first-aider should gain access to the victim, give him emergency care, reassure him, and avoid ill advised or foolhardy attempts at rescue that might jeopardize the safety of the victim as well as that of the first-aider.

I. DEFINITION OF EMERGENCY RESCUE

Emergency rescue is a procedure for moving a victim from a dangerous location to a place of safety.

II. INDICATIONS FOR IMMEDIATE RESCUE

- A. Fire, danger of fire, or explosion.
- B. Danger of asphyxia due to lack of oxygen or due to gas.
- C. Serious traffic hazards.
- D. Risk of drowning.
- E. Exposure to cold or intense heat or to intense weather conditions.
- F. Possibility of injury from collapsing walls or building.
- G. Electrical injury or potential injury.
- H. Pinning by machinery.

III. PROCEDURE

- A. When it is necessary to remove victims from a life threatening situation, the first-aider must:
 - 1. Avoid subjecting the victim to any unnecessary disturbances.
 - 2. Ensure an open airway and administer artificial respiration if it is needed.
 - 3. Control bleeding.
 - 4. Check for injuries.
 - 5. Immobilize injured parts prior to movement of the victim, if possible.

6. Arrange for transportation.

B. It is difficult for inexperienced helpers to lift and carry a person gently. They need careful guidance. If there is time, it is wise to rehearse the lifting procedure first, using a practice subject. Other factors to be considered:

1. If you must lift someone to safety before a check for injuries can be made, protect all parts of the body from the tensions of lifting.
2. Support the arms and legs, the head, and the back. Keep the entire body in a straight line and keep it from moving.
3. Sometimes, although a checkup can be made, an injured part cannot be immobilized until the victim has been moved a short distance. If a limb is injured, place one hand just above the injured area and one just below it. While helpers lift the body and another helper keeps the adjacent joints from moving, keep the injury from bending and twisting.
4. Any transfer is harmful unless the injured parts are immobilized. "Splint them where they lie," unless there is urgent danger.
5. It is usually best to wait until an ambulance is available. People who may have head injuries, fractures of the thigh, leg, and pelvis, or back injuries should not be transported sitting up. The injured parts need immobilization and the victim should be

transported lying down, with the first-aider giving particular attention to maintaining an open airway at all times.

IV. METHODS OF TRANSFER

A. Immediate rescue without assistance.

1. Pulling the victim.

If a person must be pulled or dragged to safety, he should be pulled in the direction of the long axis of his body, preferably from the shoulders, not sideways. Every effort must be made to avoid bending or twisting his neck or trunk. The danger is less if a blanket or similar object (such as a small rug or a piece of cardboard) or a board, can be placed beneath him so that he can "ride" the object. Do not try to lift or carry an injured person before a check for injuries can be made, unless you are sure that there is no major fracture or involvement of his neck or spine.

2. Lifting the victim.

A lightweight adult or a child who has no serious wounds or skeletal injuries may be carried by one person. Place one hand under his knees and the other under his upper back and armpit for support.

3. Supporting the victim.

A person who has no serious wounds or skeletal injuries, who has not had a heart attack, and who is conscious may be assisted to walk to safety. Help him to his feet, place one of his arms around your neck, hold his hand at your chest (or shoulder) level, and place your other arm about his waist for additional support. An assistant may be used, if available.

B. Immediate rescue with assistance.

Sometimes, the hazards are so great that it is necessary to move an injured person a short distance without first immobilizing the affected parts. If the victim is to be lifted by several persons, the first aid worker should devote himself to the area of greatest injury, protecting it as much as possible. He should prevent bending and twisting of injured parts, such as the limbs, by placing one of his hands just above and on top of the suspected injury and the other just below and under the part, as helpers lift the victim and support the main weight of the limb.

1. Chair carry

If a second person is available to assist, but no litter or blanket is available, a convenient technique for carrying a person is to seat him on a strong chair. This method is also satisfactory for going up and down stairs, through narrow corridors, and corners. This technique is not suitable for persons with neck or back injuries or injuries of the legs.

2. Fore-and-aft carry

The fore-and-aft carry is a two-man technique. It may be used in moving an unconscious person but it is not applicable when there are serious injuries of the trunk or there are fractures.

3. Two-handed and four-handed seats

Another two-man rescue technique is the two-handed seat or swing. If the victim has no serious injuries and is able to cooperate with his rescuers, he may be placed on a two-handed seat, with his arms about the necks of the first aid workers and his back supported by their free hands, or the four-handed seat may be used, in which case better support is provided for seating, but the victim's back is not supported.

C. Blanket techniques

If transfer is necessary before a litter can be provided, a blanket can be placed under a person for lifting and carrying him a short distance. A blanket should never be used if there is a suspected fracture of the neck or back, unless the hazard is so great that time does not permit procuring a backboard. If the use of a blanket is necessary, one first aid worker should steady the victim's head, holding traction in a straight line away from his trunk. If his body is to be turned, it is moved as a unit so that no twisting or side-to-side motion of his neck and back occurs.

1. Placing blanket under victim from the side.

Allow about two-thirds of the blanket to fall in folds or pleats beside the victim. Then place the folded (not rolled) portion snugly against his body. Grasp the victim at his hips and shoulders and roll him gently about one-eighth of a turn away from the blanket. Push the folded part of the blanket as far under the victim as possible and roll him back over the folds and approximately one-eighth of a turn in the opposite direction. Pull the blanket on through. This procedure places the victim in the middle of the blanket, which can then be rolled from the sides and used to lift him onto a stretcher or to carry him to safety. If others are available to assist, they should be used.

2. Blanket lift

- a. Roll the blanket tightly at the sides until it fits the contours of the victim's body.
- b. Two persons at the victim's shoulders grasp the blanket with their top hands at his shoulders and their bottom hands at his lower back. The two persons at the lower part of his body grasp the blanket with their top hands at his hips and their lower hands at the legs, just below the knees. No. 1 person is at the victim's head, holding slight traction.
- c. At a signal, the persons holding the blanket lean back (away from the victim), using their back muscles and weight. This action lifts the victim from 6 to 8 inches off the floor or ground so that a litter can be slid underneath.

The same procedure is used when a victim is in a prone position.

- d. All parts of the victim's body should be supported-the extremities, the head, and the trunk-and the victim's entire body should be kept immobile and in a straight line. Helpers should lift gradually, following the proper lifting instructions as given, so that they themselves will not suffer back injury. They also should guard against losing their balance. In all lifts, the leader should give appropriate preparatory signals prior to the actual signal for action so that all move as a unit; for example:

"Prepare to lift" or "Prepare to stand " and then "Stand:"

D. Three-man hammock carry

This technique may be used with the victim on his back (supine) or on his face (prone) . In either case, keep his chin up to maintain an open airway.

1. Victim in supine position

- a. Each carrier kneels on his knee that is closer to the victim's feet.
- b. No. 1, cradles the victim's head and shoulders with his top arm. His other arm is placed under the victim's lower back.

- c. No. 2, on the opposite side from No. 1, slides his top arm under the victim's back above No. 1's bottom arm and his other arm just below the victim's buttocks.
- d. No. 3, slides his top arm under the victim's thighs above No. 2's bottom arm. His other arm is placed under the victim's legs below the knees.

NOTE. The hands of carriers 1 and 2 should be placed about halfway under the victim's body at this stage.

- e. The command "Prepare to lift!" is followed by the command "Lift!" and the victim is lifted to the carriers' knees and rested there while their hands are slid far enough under the victim to allow rotation of their hands inward to secure two interlocking grips.
- f. The command "Prepare to stand!" is followed by the command "Stand!" and all carriers stand erect with the victim. To lower the victim to the ground or onto a litter, reverse the procedure.

2. Victim in prone position

The principles explained above should be used when the victim is in a prone position.

E. Three-man or four-man lift

1. Three bearers take up positions on one side of the victim and facing him, one at his shoulder, one at his hip, and one at his knees. If one side is injured, the three bearers should be on the uninjured side. A fourth bearer, if available, takes a position on the opposite side, at the victim's hip.
2. Each bearer kneels on his knee that is closer to the victim's feet. Then, simultaneously, the bearer at the victim's shoulder puts one arm under the victim's head, neck, and shoulder, and the other under the upper part of the victim's back. Each bearer at the victim's hips places one arm under the victim's back and the other under his thighs. The bearer at the victim's knees places one arm under the victim's knees and the other under his ankles.
3. The command "Prepare to lift!" is followed by the command "Lift!" and immediately all the bearers lift and place the victim in line on their knees.
4. If there is a fourth bearer, he places a stretcher under the victim and against the toes of the three kneeling bearers. The command "Prepare to lower:" if followed by the command "Lower: " and the victim is gently lowered to the stretcher. To unload a stretcher, the rescuers reverse the procedure. The method described above is also used to place a victim in bed.

When it is necessary to transport a victim in a confined area, he may be carried by three bearers. The victim would then be rolled toward them.

F. Six-man lift and carry

There are three bearers on each side of the victim. Each kneels on his knee that is closer to the victim's feet. The bearers' hands, wrists, and forearms are worked gently under the victim until the palms of their hands are about at the midline of the victim's back (or stomach). The hands should be alternated from the two sides. The two hands under the victim's head may have the fingers interlocked to form a cup for his head.

The command "Prepare to lift: " is followed by the command "Lift!" and the victim is lifted on the bearers' hands and forearms to their knees. They must be careful to keep the victim's body in a straight line. The command "Prepare to stand:" is followed by the command "Stand: " and all bearers stand erect. To lower the victim to the ground or onto a litter, reverse the procedure. If needed, additional bearers can be placed on both sides of the victim to assist in lifting.

G. Stretchers and litters

The "army litter" is most satisfactory for general use. In opening it, lock the bracing bars with your foot, if you are wearing shoes, or with the palm of your hand, not by grasping the bar with your hands and

fingers. Before using the litter for the victim, test it by lifting someone at least as heavy as the victim.

1. Improvised litter

In an emergency in which ambulance service is delayed or is not available, or in remote areas where litters or backboards are not available, an improvised litter may have to be used to transport a person either to shelter or to a source of transportation to a medical facility. A litter may be improvised from clothing, a rug, or a blanket placed over poles. If available, a lightweight canvas lounge chair, an ironing board, a leaf from a table, or a door may be used. An automobile seat is long enough for a child. Near water, such things as floats, surfboards, and water skis, as well as planks, may be used. Wheeled vehicles can sometimes be used to assist with an emergency litter, and other means of transportation may be utilized. If an ambulance or rescue vehicle can be brought to the scene, and hazards do not demand transfer, it is better to wait for the proper equipment.

2. Carrying techniques

Care must be taken to secure the injured person or invalid properly, so that he will not roll or slide during transportation. If a neck fracture is suspected, additional padding is necessary to support the victim's head and neck. Use cravat bandages or other improvised ties.

3. Positions of bearers

It is preferable to have four bearers: one at the victim's head, one at his feet, and one at each side, all facing the direction of intended movement. Each side bearer holds the side of the litter with his hand that is closer to the victim. All assume the proper lifting stance, and at the command "Lift": all stand erect.

At the command "March": the bearer at the head of the litter steps off on his right foot, and the bearers at the sides and feet step off on their left feet. To lower the litter, the bearers reverse the steps used to lift the litter.

H. The vehicle transfer

The first-aider must protect victims of accidental injury or serious illness who require vehicle transfer on a litter against hasty or ill advised transfer in trucks, station wagons, or any vehicles other than ambulances. On rare occasions, a toboggan or a substitute motor vehicle may be the only means of transport to a site not accessible to ambulances. The drive should be at moderate speeds, with gentle stops and starts and with observation of all safety rules. However well splinted or otherwise immobilized an injured part may be, a fractured or otherwise injured area sustains some harmful effect from the constant swaying and jolting of the vehicle as it rounds turns, slows down, increases speed, or encounters dips and elevations. Accident victims often benefit from a period of rest before transfer. If the subject is ill, rather than injured, the first-aider customarily

has no special preparation responsibilities unless delegated by a physician. Too often, a victim is subject to disturbing and exhausting preparation before transportation is begun.

It is most important to remember that people who may have head injuries, fractures of the thigh, leg, arm, or pelvis, or possible back injuries and those with heart attacks or chest or abdominal injuries should not be transported sitting up in automobiles. The injured parts need immobilization; the victim should be recumbent on a comfortable support; and he should be transported safely.

I. Rescues involving electrical emergencies with home appliances.

Electrocution is common in the home from low voltage current. The danger in the home is often underestimated, especially the danger to the rescuer if he touches the same equipment or the injured person. The rescuer should disconnect the attachment plug from its socket or throw the main house electrical switch if possible. It may be necessary to separate the victim from the contact by utilizing a long, very dry pole, a dry rope, or length of dry cloth. Be sure that your hands are dry and that you are standing on a dry surface.

J. Toxic or oxygen-deficient atmospheres.

First-aiders should not attempt rescues from toxic or oxygen-deficient atmospheres unless the area has been thoroughly ventilated or they have proper equipment for respiratory protection.

A room filled with gas can explode if someone turns on a light, rings the doorbell or telephone, or lights a match.

If you attempt to save someone in a gas-filled room, first shut off all the gas and electricity for the building. If there is no fire or smoke, open the windows and doors. This action will allow the gas to blow away.

Carbon monoxide poisoning is another example of toxic atmosphere that is extremely dangerous. If you rescue someone who has been poisoned by exhaust gases, remember that the poisonous gas can knock you out suddenly.

Always ventilate the area before doing anything else, then remove the victim to fresh air and give all necessary first aid.

K. Rescues involving fires.

If you are trapped in a burning building (or must enter to rescue someone), put a thick, wet cloth over your mouth and nose. This cloth will protect your air passages from the heat. It will not, however, protect you from the poisonous gases.

Before opening a door in a burning building, feel the door to check for extreme heat. If the door is very hot, try to find another way out.

If the door is cool (or slightly warm), crouch low behind the door as you open it slowly.

Usually the stairway is safer than the elevator when you are escaping from a burning building. The fire may damage the elevator and trap you inside.

If you are trapped on an upper floor, find a room with a window in it. Close the door and transom; open the window slightly and breathe the incoming air; signal for help by hanging something large (coat, sheet, rug) Out of the window; then lie on the floor.

L. Water rescue.

1. General information.

Most drownings occur within reach of safety; rescue is, hence, often possible even if the first-aider is unable to swim.

2 . Procedure.

A swimming rescue should not be attempted except by someone trained in lifesaving. Additional information can be found in the American Red Cross textbook "Lifesaving and Water Safety", which also includes a section on ice accident prevention and rescue.

- a. If a swimmer is in trouble near the dock or the side of a pool, lie down and extend your hand or foot to him; or hold out a towel, shirt, stick, fishing pole, float, deck chair, tree branch, or other object at hand and pull him to safety. Use a line or ring buoy, if possible.

If the swimmer is too far from shore for these measures, wade into waist-deep water first with a suitable object to extend to him, or push out a board to which he can cling while you go for help, or grasp his wrist and pull him to safety.

- b. If a rowboat is available, row out to the victim and let him grasp the stern, or extend an oar and draw him around to the stern where he can hang on while you row to shore. If he is unable to hold onto the stern or the oar, pull him to the boat, and, after checking for injuries, pull him into the boat.
- c. Persons who drown usually die from lack of air and not from water in the lungs or stomach. Do not try to get water out of a victim. Start artificial respiration right away, whether you are in a boat, supporting the victim at the side of a boat, pulling him ashore, or on the shore.
- d. As soon as the victim is able to breathe for himself, give him care for shock and get medical assistance.

M. Ice rescue.

1. A useful device for ice rescue is a light ladder, from 14 to 18 feet long, with a light, strong line attached to the lowest rung.
2. The ladder should be shoved out on the ice to the limit of its length, and the cord will serve as an extension.
3. The rescuer may crawl out on the ladder to assist the victim if necessary. If the ice breaks under the ladder, the ladder will angle upward from the broken ice area and can be drawn to safety by other persons.
4. Other usable rescue devices are buoys, ropes, sticks, poles, and even a human chain of rescuers lying prone on the ice.
5. Victims of skating accidents who fall through the ice may require artificial respiration, which should be administered on the way to shelter, as well as warming and treatment for shock.

Section 16

EMERGENCY CHILDBIRTH

16.1 **LEARNING GOAL:** The student will know the three steps of labor.

PERFORMANCE OBJECTIVE:

16.1.1 The student will list all three stages of labor.

16.2 **LEARNING GOAL:** The student will develop the basic skills and knowledge needed to evaluate and prepare for an emergency childbirth.

PERFORMANCE OBJECTIVE:

16.2.1 The student will list those things done to evaluate an expectant mother and then list the order in which one would prepare for an emergency childbirth.

16.3 **LEARNING GOAL:** The student will be able to recognize and treat common complications of childbirth.

PERFORMANCE OBJECTIVE:

16.3.1 The student will explain the typical childbirth complications and how to deal with them.

16.4 **LEARNING GOAL:** The student will possess the knowledge and skills to handle a normal, multiple, premature, breeched, stillbirth, and miscarriages should they arise during the emergency delivery.

PERFORMANCE OBJECTIVE:

16.4.1 The student will demonstrate or list the steps taken during a normal childbirth. The student will also describe the steps to follow in the event of multiple, premature, breeched, stillbirth or miscarriages.

RESOURCE MATERIAL:

Although pregnancy and labor are usually normal physiologic processes, the health and safety of both mother and child may depend on regular visits to a physician for prenatal care and on medical assistance at the time of delivery. At times, complications arise that lead to emergency situations. Three of these have been mentioned previously; a ruptured tubal pregnancy with concealed hemorrhage into the abdominal cavity, unusual bleeding from the vagina at any stage, and convulsions associated with pregnancy that is eclampsia.

The onset of labor is usually gradual, and there is sufficient time for consultation with a physician by telephone and for transportation to a hospital for delivery of an infant under sterile conditions. Currently in the United States, 95 percent of all infants are born in hospitals, and the births of 98 percent are attended by physicians. Having proper medical care is the best way to have a baby, for the safety of mother and child. The procedures described below are not substitutes for medical care before, during, and after birth, but are given because the first aid worker may at times be called on to assist in emergency childbirth. If birth is imminent, every effort should be

made to seek medical help or to find a relative or neighbor who has assisted in childbirth. In every instance in which emergency childbirth occurs outside the hospital, the mother and infant should be taken to a hospital as soon as possible for examination and treatment.

I. SIGNS AND SYMPTOMS OF IMPENDING CHILDBIRTH

A woman having her first child, as well as one who has had several previous pregnancies, may experience a very rapid course of labor. Because of miscalculations in the anticipated delivery date, premature onset of labor after an accident, delay in transportation, and other such factors, a woman's labor may begin unexpectedly. If the labor contractions are approximately 2 minutes apart, and the woman is straining or pushing down with contractions, crying out constantly, and perhaps warning that the baby is coming, she needs help immediately.

A. Reasons for rapid course of labor.

1. Miscalculations in delivery date.
2. Premature onset of labor after an accident.
3. Delay in transportation.

B. Signs of delivery.

1. Contractions timed at 2 minutes apart.

II. DELIVERY PROCEDURES

A. Position of the Patient

Underclothing that will interfere with delivery should be removed as quickly as possible or pushed up out of the way, and the woman should lie down on her back, with knees bent, feet flat, and thighs separated widely--on the floor, the seat of an automobile, the ground, or any other flat surface. If the woman is at home and there is time, she may lie across the bed in the same position, with her feet resting on two straight chairs and her thighs and abdomen covered with clean towels or sheets. In a public place, if others are around, quickly arrange for as much privacy as possible by having people stand around the woman with their back turned to her to shield the scene from others. Place newspapers, a clean cloth, or clothing under the woman's buttocks, if any such material is available. If water is close by, wash your hands.

B. Inspection of the Presenting Part

Inspect the opening of the woman's birth canal (vagina) to determine whether the baby's head is visible at the time of contractions. (It recedes back up into the birth canal between contractions.) The back of its head is usually the presenting part; a wrinkled scalp and hair may be noted, although the head may still be enclosed in the bag of waters. If the woman has had previous pregnancies, and the exposed area of the baby's head is approximately the size of a 50-cent piece, or larger, delivery will probably occur within a few minutes, during

the next two or three contractions. If the woman is having her first child and the exposed area of the baby's head is smaller than a 50-cent piece, proceed to the nearest hospital, if it is not more than 20 minutes away. You will probably arrive in time. Meanwhile, encourage the woman not to bear down or strain with contractions, but instead to breathe in and out rapidly with short, panting breaths.

Never try to hold back the baby's head or tell the woman to cross her legs to delay delivery. Such maneuvers may seriously injure the infant. Never place your hands or fingers into the birth canal at any time, because of the danger of infection. Allow the delivery to proceed without interference until the baby's head has emerged fully.

A rare but urgent crisis exists when, upon rupture of the bag of waters, the cord protrudes into the birth canal. The patient should be taken to the hospital immediately and meanwhile should stay in a jackknife or knee-chest position to relieve pressure on the cord and prevent shutting off the blood supply to the infant.

C. Delivery of the Head

As the infant's head emerges, be prepared to guide and support it with your hands to prevent its becoming contaminated with blood, mucus, and fecal material. If the bag of waters breaks at this point, birth will probably take place rapidly. If the baby's head passes through the birth canal to the outside with the bag still unbroken, tear it with your fingers to let the fluid escape and prevent aspiration as the infant takes its first breaths. As a rule, the infant's face is

down; positions with the face up are much less common. When the head emerges, check it once to see whether the umbilical cord which looks like a soft, thick, gelatinous white rope is not wrapped around the infant's neck. If so, gently but quickly slip it over the baby's head with your forefinger between its neck and the cord. If the cord is wrapped around its neck more than once, or for some other reason you cannot slip it over the baby's head, it must be cut immediately to prevent strangulation. Squeeze the cut ends with gauze, cloth, or your fingers until ties can be applied.

If any part of the baby other than its head is seen at the opening of the birth canal, for example its buttocks (a breech birth), hand, or foot. The chances for a safe birth are much less, and you should proceed at once to the nearest hospital. Do not pull on any part and do not attempt to deliver the infant yourself.

As the baby's head emerges, it turns naturally to one side. Do not turn it. Hold it gently, and as soon as possible, wipe out the infant's mouth with clean cloth, gauze, or facial tissues. Do not pull on its head.

D. Delivery of the Shoulders

As soon as the baby's shoulders start through the birth canal, lift slightly upward with your hands, supporting its head and neck, to assist them to emerge. The rest of its body will be expelled quickly. Remember that a baby is slippery.

E. Resuscitation of the Infant

The most important first aid procedure in emergency childbirth is assisting the infant to begin breathing. First, keep it warm. It may be dark blue; but within 1 or 2 minutes, when it starts breathing and crying, it will gradually turn a rosy pink. To assist it, lower its head, elevating the feet and the lower part of the body by grasping the ankles with your hand (protected by a clean cloth if possible, to prevent slipping). Stroke along the baby's neck from its chest toward its mouth with a milking motion, and wipe out its mouth again. If the infant is not crying, rub its back or flick the bottom of its feet with your thumb and forefinger. If it is still not breathing, give artificial respiration in gentle puffs, through the mouth and nose, one every 5 seconds. As soon as it is breathing well, wrap it up, if possible, and put it down with its head extended back and a pad under its shoulders to keep the airway open. If the mother can help, she may hold the baby on her abdomen. Watch the cord--it should be kept slack, without any tension.

F. Cutting the Cord

No harm will result if the infant is left attached to the afterbirth by the umbilical cord until the mother can be taken to the hospital. This procedure is preferable to cutting the cord with unclean instruments or using an improper cord tie. If the cord is strangling the baby as its head emerges, however, the cord must be cut as a lifesaving procedure.

If the decision is made to tie and cut the cord while waiting for contractions to resume to expel the placenta, wait until all pulsations of the cord have stopped--about 5 minutes. At home, use a new razor blade (one-edged, if possible) or take the time to boil scissors or soak them in rubbing alcohol or after-shave lotion or other alcohol-based preparations for 20 minutes. Boil new white shoelaces or narrow strips of clean white cloth for 20 minutes; they may be applied wet. (Sterile cord ties may be purchased or prepared in advanced by sterilization in aluminum foil in an oven at 350 F for 3 hours.) The cord must not be cut closer than 4 inches from the infant's navel. Tie a square knot (or two or three simple knots) 4 to 6 inches from the baby and a second knot 8 inches from the baby. Cut between. (The cord end attached to the baby dries out, shrivels up, and falls off within a few days.)

G. Expulsion of the Afterbirth

Shortly after the birth of the baby, the mother's contractions resume in preparation for expelling the afterbirth (placenta), as it detaches from the wall of the womb (uterus). Do not pull on the cord, and do not push hard on the mother's abdomen in an effort to hurry things along. Severe damage to the uterus may result, with perhaps fatal hemorrhage. As soon as the afterbirth emerges, however, place your hand over the mother's lower abdomen and massage the uterus gently but firmly for a few minutes. The massaging will stimulate the uterus to contract and will help control bleeding. Repeat every

5 minutes for at least the next hour or until the mother is seen by a physician. Save the afterbirth and take it to the hospital with you.

III. CARE AFTER DELIVERY

A. After a home delivery, gently cleanse the vaginal opening with a clean moist towel, or pour soapy water over the vaginal opening, from above the rectum, and rinse by pouring warm water over the entire area. Lay a sanitary napkin or other suitable clean cotton material across the vaginal opening.

B. Give the mother tea, coffee, or other fluids and keep her warm.

C. Do not attempt to cleanse the vernix (the white, greasy protective coating) covering the babies skin. Do not wash its eyes, ears, or nose. Check to be sure that its breathing is normal and that it is kept warm during transfer to the hospital.

D. If the afterbirth is not expelled within a reasonable length of time or if it is not completely expelled, there is danger of hemorrhage. Medical care should be sought without delay. Do not pull on the afterbirth or on the cord.

E. If there are tears in the birth canal, with serious bleeding, treat as an open wound by applying direct pressure to the bleeding area with a pad of sterile or clean cloth.

IV. SUPPLIES FOR EMERGENCY CHILDBIRTH

A. In anticipation of emergency childbirth at home or en route to the hospital, assemble newspapers, plastic bags, or other material to protect bedclothes or car upholstery; clean towels; one or two folded sheets; a set of sterile cord ties or sterilized shoelaces; a new razor blade in protective paper (one edged), alcohol, scissors, sanitary napkins, a receiving blanket for the baby, a diaper, and safety pins.

B. For a long automobile ride, have the mother wear a nightgown or slip and a robe (no other underclothing) and place a sanitary napkin or clean, folded towel between her thighs if the bag of waters has broken or if blood and mucus are draining from the birth canal. Take along a flashlight, if the trip will be at night, a blanket and pillow, and a container of some sort for the afterbirth.

Section 17

VEHICLE EXTRICATION

17.1 LEARNING GOAL: The student will be familiar with the various methods and ancillary equipment used to extricate victims.

PERFORMANCE OBJECTIVE:

17.1.1 The student will list the ways in which access can be made to a vehicle and the best equipment to use to accomplish the task.

17.2 LEARNING GOAL: The student will be familiar with the problems encountered in giving emergency care to a trapped victim.

PERFORMANCE OBJECTIVE:

17.2.1 Given a practical situation, the student will demonstrate to the instructors satisfaction how to administer emergency care to a trapped victim.

17.3 LEARNING GOAL: The student will possess the knowledge and skills needed to disentangle a victim trapped in a motor vehicle.

PERFORMANCE OBJECTIVE:

17.3.1 The student will demonstrate the proper methods of disentanglement given various situations.

17.4 LEARNING GOAL: The student will be able to make preparations for and actually remove a victim of an entrapment.

PERFORMANCE OBJECTIVE :

17.4.1 The student given a situation of entrapment will coordinate, prepare, and remove a victim from a vehicle. This removal will be accomplished using proper backboards, cervical collars, and ancillary equipment.

17.5 LEARNING GOAL: The student will possess the knowledge and skills needed to transport victim from a crash site to a location where transportation can be accomplished. This transportation to include, but not limited to up or down hills, across rivers, canyons or other hazardous terrain.

PERFORMANCE OBJECTIVE:

17.5.1 The student will demonstrate, using a mock victim, how to transport him from a crash site to a waiting ambulance. This scenario should include, but not be limited to routine or hazardous terrains.

RESOURCE MATERIAL :

I. METHODS OF REMOVING VICTIMS TRAPPED IN VEHICLES OR WHO BECOME ENTANGLED AS A RESULT OF MOTOR VEHICLE ACCIDENTS OR OTHER CATASTROPHES.

Methods for removal should always keep in mind as a high priority the safety of the initial victim and the safety of any and all rescuers in the area. The rescuer should not be so preoccupied with the rescue that they fail to provide for their own safety. Methods in removal can be as simple as dragging the victim to safety through and included a complete total extrication using backboards, cervical

collars, ancillary hydraulic equipment, like the jaws of life, power packs, or other commercially manufactured rescue type equipment.

A. Methods of gaining access to a vehicle that may have been damaged in a collision.

1. There are many methods to gain access. Some of the very basic methods should not be overlooked, like simply attempting the vehicle doors. The officer needs to check to insure that all the doors are tried before giving up and attempting a more elaborate form of rescue. If the doors cannot be opened and time is a critical factor, glass may be broken to gain access. If window glass is to be broken the officer should break a window at a point as far removed from any injured victims as possible. The officer should use a sharp instrument and punch a small hole in a lower corner of the window, thus minimizing glass shattering and any broken glass being forcefully propelled into the passenger compartment. Once the safety glass has been punched the majority of the glass may be easily removed from the window frame allowing access to the interior portion of the vehicle.

2. Other means of access might be to carefully remove windshield or rear window, first by prying loose the metal or aluminum molding and then by removing the rubber or fiber caulking strips, then by prying the edge of the window with a knife or tire tool to break loose the glue then pulling the rear window or windshield

out, thus allowing access to the interior. A sharp hand axe or hatchet might also be utilized to cut the center of a windshield, however, this should be used as a last resort due to the fact that it does propel small glass fragments into the passenger compartment regardless of how careful the rescuing officer may be.

B. Problems that may be encountered in giving emergency care to trapped victims may include the vehicle being upside down or on its side or the fact that an environmental hazard, like spilled gasoline, downed power lines or the vehicle teetering on an embankment or cliff may be encountered. Again, the officer must maintain his own personal safety while attempting to give emergency care to a victim trapped as a result of the accident. The officer may use some basic equipment carried in his own patrol vehicle in an attempt to stabilize a hazardous vehicle, like a spare tire, a hub cap, or in some instances, the bumper jack of his vehicle could be utilized to provide stability to an unstable accident vehicle. Once the danger to the officer and additional danger to the victim has been alleviated or minimized, emergency care can begin. Problems facing the officer may be the position of the victims, the fact the vehicle is in an abnormal position, and the location of injuries on the victim.

C. Should the rescuing officer encounter a vehicle accident where the victim is entangled as a result of the accident, the officer needs to disentangle the victim, keeping some basic things in mind as to the

victim's body position. Every effort should be made to minimize movement of the neck and spine area in the event there are cervical or spinal injuries. Every attempt should be made when moving long bone groupings, arms or legs to minimize the possibility of compounding a simple fracture. It may become necessary to use some ancillary cutting tools to disentangle the victim from the vehicle itself.

D. Once the victim has been disentangled, proper preparations for actual removal of the victim must be accomplished. It is recommended that some form of litter or stretcher be brought to the location prior to moving the victim from the vehicle. By staging a stretcher or litter close to the accident scene, it will minimize movement of the victim thus preventing the possibility of further injury. Once the litter or stretcher has been staged the proper removal techniques should be followed. For proper removal, if possible a second rescuer should get into the rear seat of the vehicle or of a single seater to the outside of the vehicle reaching in. The rescuer needs to apply some upward pressure or traction on the victim's neck and spine to minimize the possibility of injury to the spinal column. This pressure should be accomplished by placing the middle fingers along the bottom of the jaw bone, the index fingers along the cheek area, the ring and middle fingers underneath the jaw and the thumbs toward the back of the victim's head. An even upward pull should then be applied, thus bringing the victim's neck

and back to alignment and in moderate traction. While the rescuer is holding this position, a second rescuer needs to reach around the arms of the first rescuer and apply either a commercially manufactured cervical type collar or one that has been implemented using blankets, cloth, paper or other appropriate material to maintain some rigidity in the neck area. Once the cervical collar has been attached, the first rescuer may gently lessen the traction, however, should maintain control of the head so it does not fall forward, backward, or to either side. When the head, neck and spine have been stabilized, a small backboard should be utilized and placed into the vehicle behind the back of the victim. It should be noted that the top portion of the back-board should be placed into the vehicle first to minimize the possibility of catching the top of the backboard on the rough line of the vehicle. Once the backboard has been placed behind the victim, the victim may be gently leaned backward onto the small backboard. Once this has been accomplished by the use of velcro type straps or triangle bandages folded to a cravat configuration, the victim's head needs to be stabilized. Prior to stabilizing the head, a small towel or blanket substitute, pillow, etc. Could be placed behind the victim's neck between the neck and the backboard for the victim's comfort. Once this has been accomplished a triangle bandage or velcro type band should be attached around the victim's forehead anchored to the lower portion of the head section of the small backboard. A Second cravat or velcro strap should then be applied at the point of the chin,

low on the victim's face and tied high on the neck portion of the small backboard. Once these two have been attached, the victim's head and neck should be stabilized. Caution should be exercised when applying the head strap to insure that the chin strap is applied last, so in the event the victim were to regurgitate the bottom strap could be loosened quickly to allow the victim to expectorate. If the small backboard is equipped with seat belt type fasteners for the chest and abdomen area, they may be snugly attached to the victim, however, not so snugly as to complicate any internal injuries the victim may have suffered. If the small backboard is not equipped with seat belt type fasteners, then triangle bandages folded into a cravat configuration may be used. If the cravats are used the first cravat should be tied underneath the victim's arms and securely attached to openings in the small backboard. The next cravat should be attached around the abdomen area of the small backboard to insure stability. Once all four cravats, two for the head, one for the chest area and one for the abdomen have been securely attached to the victim, securing the victim to the small backboard, preparations for removing the victim from the vehicle can be completed. A large backboard should be brought to the side of the vehicle, where the victim will be removed from. The large backboard should be kept at the same plane and even with the small backboard to minimize its falling down to the level of the large backboard causing the head and neck area to flex downward. The victim can then be easily removed from the vehicle by placing the victim's feet on top of the

transmission hump, if the vehicle is so equipped, and then by pivoting the victim to his right or left, depending on the side of removal and lying the victim out onto the long backboard. If the victim is in the driver's seat, caution should be exercised during the pivoting process to insure that the victim's elbows do not become entangled in the vehicle's steering wheel. Once the victim has been laid out onto the long backboard, and the victim's legs placed onto the seat of the vehicle, the victim may be carefully lifted in small four or five inch increments out onto the long backboard. Do not merely pull on the small backboard. This may cause the victim to slip down the small backboard, creating stress on the victim's neck or spine area. The victim should be gently lifted in small increments until they have been removed from the vehicle and placed onto the long board. Once the victim has been placed onto the large backboard the victim can then be easily carried from the crash site to an awaiting stretcher or gurney for removal from the scene by an ambulance or a medically equipped helicopter type ambulance.

E. If once the victim has been removed from the car, the vehicle is in such terrain that easy transportation from the scene to an awaiting ambulance or ambulance equipped helicopter cannot be accomplished, and the victim must be transported over rough or hazardous terrain, additional precautions should be taken.

1. If possible, a basket or stokes type stretcher should be utilized so the victim may be securely affixed in the stretcher. With this

type of stretcher the victim could be removed vertically or horizontally, depending on the terrain to such a location where transportation from the scene could be accomplished. The use of an air ambulance in rivers, canyons, or other hazardous terrain is recommended. Additional precautions must be taken to minimize the amount of jostling or rough handling of the victim. Ropes, rescue pulleys, other sophisticated equipment could be used to traverse or belay victims across rivers or canyons, however, this technical type of procedure should be left to a para rescue specialist or a mountaineering rescue unit that can be accessed by the law enforcement agency in charge and requested to respond to the scene.

Section 18

CARDIOPULMONARY RESUSCITATION

18.1 **LEARNING GOAL:** The student will gain a working knowledge of cardiopulmonary resuscitation and the skills needed to perform C.P.R.

PERFORMANCE OBJECTIVE:

- 18.1.1 The student will list the basic function, and structures of the heart, lung systems.
- 18.1.2 The student will demonstrate the proper methods of opening an airway, doing rescue breathing, and closed chest heart massage in performing basic cardiac life support.
- 18.1.3 The student will define the basic steps of artificial respiration and common complications that may arise during artificial respiration.
- 18.1.4 The student will demonstrate the techniques of performing mouth-to-mouth resuscitation, mouth-to-nose resuscitation, and mouth-to-stoma resuscitation.
- 18.1.5 The student will list the basic reasons and principles of external cardiac compressions as it relates to C.P.R.
- 18.1.6 The student will demonstrate on a training manikin proper basic life support for adults and children. The student will perform both one and two rescuer C.P.R.

RESOURCE MATERIAL

I. CARDIAC ARREST VICTIM

A. Establishing unresponsiveness

The rescuer should come up to the victim, gently shake his shoulder and ask, "Are you O.K.?" When one comes upon a person lying apparently unconscious, how can one tell whether he is, indeed, unconscious or if he is just sleeping? If the victim is not responsive, and unconscious there may be a need of immediate CPR. Violent shaking may compound injuries that are present, particularly if neck injuries are present.

B. Calling out for help

If the victim does not respond to your attempts to arouse him, call out for help. Even if no one is in sight, call out in the hope that someone will be within earshot who can assist you or go call an ambulance.

C. Positioning the victim

If the victim is crumpled up and lying face down, he's not in a position to begin CPR. So you must roll the victim over as you call for help. You must exercise great care in rolling the victim over, for the individual may have broken bones or other injuries which could be complicated by improper technique.

Roll the victim as a unit so that the head, shoulders and torso move simultaneously with no twisting.

You are going to kneel beside the victim, and place your hands so you can support the neck and roll the victim toward you.

Kneel beside the crumpled victim a few inches from his side. Raise the victim's arm which is nearest to you and straighten it out above the head. Then adjust the legs so they are nearly straight or bent only slightly at the knees.

Place one hand on the back of the victim's head and neck to prevent it from twisting.

With your second hand grasp the victim under his arm to brace the shoulder and torso. This will be the major point on the body where you'll exert the pull to roll the body over.

Pull steadily and evenly to move the weight without twisting the body. Pull evenly and carefully, and the torso and hips will follow the shoulders with minimal twisting.

Watch the head and neck.

Try to keep the body from twisting. (There may be neck or spinal injuries you don't want to complicate!)

The victim should end up flat on his back, in position for you to begin CPR.

D. Opening the airway

The most common cause of airway obstruction in the unconscious victim is the tongue. Since the tongue is attached to the lower jaw, moving the lower jaw forward lifts the tongue away from the back of the throat and opens the airway. As long as there is enough tone in the muscles of the jaw, tilting the head back will cause the lower jaw to move forward and open the airway.

E. Head tilt

Head tilt is accomplished while the rescuer is at the victim's side, placing one hand on the victim's jaw and the other hand on the forehead. The rescuer then tilts the head by backward pressure on the forehead and upward pressure on the jaw. If loose dentures are a problem they may be removed.

F. Head tilt - Chin lift

Negative pressure is created in a person's airway during inspiration. For an unconscious person making inspiratory effort, and thus creating negative pressure in the airway, his tongue, if close to the posterior wall of the pharynx, may act as a valve and occlude the airway during inspiratory effort. Even though the head is tilted back and the neck extended, the lower jaw sometimes needs support to adequately lift the tongue and provide an open airway. Frequently, due to Central Nervous System (CNS) depression, there is such profound relaxation of the muscles of the jaw that head tilt alone is not

enough to open the airway. Deep CNS depression can be caused by progressively severe lack of oxygen to the brain resulting from heart attack, lung disease, internal hemorrhage, drug overdose, electrocution, drowning or trauma. Support of the lower jaw may be accomplished by lifting the chin. The fingers of one hand are placed under the lower jaw on the bony part near the chin and lifted to bring the chin forward, supporting the jaw and helping to tilt the head back. The fingers must not compress the soft tissue under the chin which might obstruct the airway.

The other hand rests on the victim's forehead to tilt the head back. The thumb is used rarely when lifting the chin, and then only to lightly depress the lower lip never for lifting the chin.

THE CHIN SHOULD BE LIFTED SO THAT THE TEETH ARE NEARLY BROUGHT TOGETHER. AVOID COMPLETELY CLOSING THE MOUTH. If the victim has loose dentures they can be held in position, making obstruction by the lips less likely. If rescue breathing is needed, the mouth to mouth seal is easier when dentures are in place. If dentures cannot be managed in place, remove them.

G. Establishing breathlessness

When maintaining the open airway position, the rescuer places his ear over the victim's mouth and nose, looking toward the victim's chest and stomach.

LOOK for the chest to rise and fall.

LISTEN for air escaping during exhalation.

FEEL for the flow of air on your cheek.

H. Jaw thrust

Additional forward displacement of the jaw may be required. This can be accomplished by the rescuer grasping the angles of the victim's lower jaw and lifting with both hands, one on each side, displacing the mandible forward while tilting the head backwards. The rescuer's elbows should rest on the surface on which the victim is lying. If the lips close, the lower lip can be retracted with the thumb. If mouth to mouth breathing is necessary, close the nostrils by placing your cheek tightly against them.

The jaw thrust technique is the safest first approach to opening the airway of a victim who has a suspected neck injury because in most cases it can be accomplished without extending the neck. The head can be carefully supported without tilting it backwards or turning it from side to side. If this is unsuccessful, the head should be tilted back very slightly and another attempt made to ventilate.

It should be stressed that, although the rescuer may notice that the victim is making respiratory efforts, the airway still may be obstructed. Many times opening the airway is all that is needed. If the victim resumes breathing, the airway is simply maintained. If the victim isn't breathing apply rescue breathing.

1. Rescue breathing

With the thumb and index finger of the hand that is on the forehead, the rescuer gently pinches the nostrils closed so that air won't escape. Then he takes a deep breath, opening his mouth very wide and placing it around the outside of the victim's mouth making a seal. He blows air into the victim's mouth. Out of the corner of his eye, the rescuer watches to see if the victim's chest is rising. If it is, the lungs are being ventilated.

Individual ventilation should be limited to that required to see the chest rise. In most adults this is usually a minimum volume of 800cc an adequate ventilation does not need to exceed 1200cc. Below 800cc, ventilation is probably inadequate. Breaths during rescue breathing and ventilations interposed during two person CPR need not exceed 1200cc.

Two lifters should not be exceeded when giving the four quick full breaths at the beginning of rescue breathing and on the two ventilations following 15 chest compressions during one person CPR.

Volumes in excess of 2 liters are likely to be associated with pharyngeal pressure exceeding the esophageal pressure and result in air entering the stomach.

After delivering each breath, the rescuer quickly turns his head toward the victim's chest in order to take a breath of fresh air.

Initially give **FOUR QUICK FULL BREATHS** without allowing time for full lung deflation between breaths. Quickly take in a breath of fresh air between each ventilation. Throughout the time of giving the four breaths positive pressure is maintained in the airway. If breathing has stopped, even for a short time, some of the small air sacs of the lung collapse. These are more effectively filled and ventilated by maintaining positive pressure in the lungs during the four initial full breaths.

TWO QUICK FULL BREATHS, without allowing time for full lung deflation between breaths, are delivered after each cycle of 15 compressions in single rescuer CPR.

ONE BREATH EVERY FIVE SECONDS is performed either for nonbreathing victims with a pulse (rescue breathing alone), or during 2 rescuer CPR. During 2 rescuer CPR, the breath is interposed during the upstroke of the fifth chest compression.

J. Problems which are encountered learning mouth to mouth rescue breathing:

1. Rescuer not opening his own mouth wide enough. This results in an inadequate seal and causes air leaks.
2. Applying too much pressure of the rescuer's mouth against the victim's mouth. This usually results in working too hard at making

the seal. This seal can be made by the very lightest touch of the rescuer's mouth with the mouth of the victim. A bruise may appear on the lower lip of the student rescuer, indicating too much pressure being applied.

3. The student rescuer with dentures may have difficulty with dentures coming loose. This problem can frequently be overcome by learning to make very light mouth to mouth contact, thereby avoiding pressure on the dentures and making them loose.

An occasional rescuer will find air going between the upper denture and the palate. If light contact with the victim's mouth does not solve the problem he may need to perform rescue breathing with his own tongue applying pressure against his upper denture. Removal of the rescuer's dentures is the last resort. Mouth to mouth contact is more difficult and some air leak is unavoidable, but adequate rescue breathing is possible.

4. The nostrils are closed with the least effort when pinched right at the nasal openings.

MOUTH TO NOSE VENTILATION is more effective than mouth to mouth ventilation in some cases. The former is recommended when it is impossible to open the victim's mouth, when it is impossible to ventilate through his mouth, when the victim's mouth is seriously injured, and when it is difficult to achieve a tight seal around his mouth. For the

mouth to nose technique, the rescuer keeps the victim's head tilted back with one hand on the forehead and uses the other hand to lift the victim's lower jaw and close the mouth. The rescuer then takes a deep breath, seals his lips around the victim's nose, and blows in until he feels the lungs expand.

The rescuer removes his mouth, and the victim is allowed to exhale passively. The rescuer can see the chest fall when the victim exhales. When mouth to nose ventilation is used it may be necessary to open the victim's mouth or separate his lips to allow the air to escape during exhalation because the soft palate may cause nasopharyngeal obstruction and interfere with exhalation through the nose.

MOUTH TO STOMA artificial ventilation should be used for persons who have had a laryngectomy. They have a permanent stoma that connects their trachea directly to skin. It is recognized as an opening at the front of the base of the neck. For a patient with a temporary tracheostomy tube in his airway, it is usually necessary for the rescuer to seal the victim's mouth and nose with his hand or a tightly fitting face mask to prevent leakage of air when the rescuer blows into the tracheostomy tube. This problem can be prevented if the tracheostomy tube is provided with an inflatable cuff.

No adjuncts are required for effective rescue breathing, so artificial ventilation should never be delayed to obtain or apply adjunctive devices.

K. Establishing presence or absence of pulse

In a real life situation, finding no pulse makes the diagnosis of cardiac arrest.

1. Why the neck pulse?

- a. Most accessible
- b. Most reliable
- C. Most easily learned and remembered

2. Method

When the rescuer is kneeling at the victim's side the hand is left on the forehead to maintain head position and the other hand is used to palpate the carotid pulse. The pulse is felt on the side of the victim's neck nearest to the rescuer.

The rescuer puts the tips of his fingers gently on the windpipe, then slides the fingers to the side nearest him, gently pressing the soft part of the neck next to the windpipe. If there is a pulse, it can be felt this way.

Note: the neck or carotid pulse lies in a groove created by the windpipe and the large strap muscles of the neck. The pulse should be felt on the side nearest to the rescuer because:

- a. There is a tendency for the windpipe to support the palpating fingers, interfering with feeling the pulse if felt for on the far side of the rescuer.
- b. There is a tendency for students to become heavy handed feeling for the pulse on the away side pressing down on the windpipe and impairing the airway both with pressure on the airway and reversing the proper head tilt position.
- c. There is a tendency to feel with the fingers on the far side and the thumb on the near side. Do not feel for neck pulses on both sides at the same time.

L. Activate EMS System

If the rescuer is not alone, one person should be sent to call the emergency telephone number to activate the emergency system.

The shorter the time interval between collapse and initiation of basic CPR and ACLS, the more likely will be the survival of the cardiac arrest victim. If the rescuer is alone, he may perform CPR for one minute and then quickly telephone for help. The decision as to when to telephone for help is affected by a number of variables, including the possibility of someone else arriving on the scene.

If no telephone is available, the only option is for the rescuer to continue CPR.

M. Mouth to mouth breathing in one rescuer CPR

If the pulse is present, the rescuer continues to perform rescue breathing, ventilating the lungs once every five seconds until help arrives. He should recheck continued presence of the pulse after each 12 ventilations (or 1 minute). If the rescuer can't feel a pulse, he is going to have to circulate the blood as well as breathe for the victim. This is done by applying external heart compression.

N. External chest compression

The victim always must be in the horizontal position external heart compression is performed. During arrest, even during properly performed external compression, there is inadequate blood flow to brain when the body is in an upright position.

1. With the middle and index fingers of the lower hand the rescuer locates the lower margin of the victim's rib cage on the side next to the rescuer.
2. The fingers are then run along the rib cage to the notch where the ribs meet the sternum in the center of the lower chest.
3. With the middle finger on the notch, the index finger is placed next to the middle finger on the lower end of the sternum. (Note that the location of the xiphoid is irrelevant if this technique is utilized.)
4. The heel of the other hand (which has been used on the forehead to maintain head position) is placed on the lower half of

the sternum, and just next to the index finger which is next to the middle finger that located the notch. The long axis of the heel of your hand should be placed on the long axis of the breastbone.

This will keep the main line of force of compression on the breastbone and decrease the chance of rib fracture.

5. This first hand is then removed from the notch, placed on top of the hand on the sternum so that both hands are parallel and directed straight away from the rescuer. (Alternate methods of locating the correct pressure point are acceptable if they accomplish the same hand position on the chest.)

6. The fingers may be either extended or interlaced but must be kept off the chest.

7. Because of varying size and shape of different people's hands, an alternate acceptable hand position is grasping the wrist of the hand on the chest with the hand which has been locating the lower end of the breastbone. This technique is helpful for those rescuers with arthritic problems of the hand and wrist.

8. The elbows are straightened by locking them, and the rescuer positions his shoulders directly over his hands so that the thrust for external heart compression is straight down. If the thrust is other than straight down the torso has a tendency to roll, part of the effort is lost, the chest compression is less effective and requires an inefficient amount of effort from the rescuer.

9. To achieve the most pressure with the least effort, lean forward until your shoulders are directly over your outstretched hands. That is, lean forward until your body reaches a point of natural imbalance at this point you feel like you would fall forward if your hands and arms were not supporting you. The weight of your back creates the necessary pressure when your body is off balance this way; and it's much easier on your arms and shoulders. The shoulders of the rescuer should be directly over the breastbone of the victim.

10. To compress the sternum of a normal sized adult you must push with enough force to depress the sternum 1-1/2 to 2". with each compression you want to squeeze the heart or increase the pressure within the chest so that blood moves through the body. Then you must release the pressure to allow the heart and lungs to refill. You must compress in this manner at a rate of 80 times per minute in one rescuer CPR.

11. If you use the weight of your upper body this way, you do not depend on the strength of your arms and shoulders as much. Instead of having to push from your shoulders, you let the natural weight of your body falling forward provide the force to depress the victim's sternum. Keep the arms straight.

12. Do not push with all your strength but push with just enough force to depress the sternum 1-1/2 - 2 inches. This is about as far as it will comfortably go. This may compress the heart between

the breastbone and the spine and force blood out of the heart for circulation to vital organs of the body. Blood circulated to the lungs will pick up oxygen necessary to maintain life. Recently it has been recognized that many persons suffering cardiac arrest and undergoing proper cardiopulmonary resuscitation will not have their heart compressed between the breastbone and spine. Nonetheless cardiopulmonary resuscitation as presently performed is effective in circulating blood to the brain and other vital organs as a result of a generalized increasing pressure within the chest cavity. Because of certain unique properties of the arteries and veins of the body, this pressure within the chest cavity is transmitted into the arteries outside the chest to a greater extent than into the veins outside the chest. with the arterial pressure outside the chest being higher than the venous pressure such as the brain.

13. Then you must release this pressure to allow blood to flow into the heart and lungs. If the heart and lungs cannot refill, there will be no blood to carry oxygen throughout the body on the next compression. Therefore, release the pressure completely and allow the chest to return to its normal position. The time allowed for release should be equal to the time required for compression.

14. Do not lift your hands off the chest, or change their position in any way, because correct hand position may be lost. Bouncing

compressions must be avoided since they are less effective and are more likely to cause injury.

15. COMPRESSIONS ALTERNATING WITH TWO VENTILATIONS

0. One rescuer CPR

1. One rescuer CPR - Rates and Ratios

- a. Perform 15 cardiac compressions at a rate of 80 per minute. Count one and, two and, three and, four and, five and, six and, seven and, eight and, nine and, ten and, eleven and, twelve and, thirteen and, fourteen and, fifteen.

ALTERNATE METHODS OF COUNTING ARE PERMISSIBLE AS LONG AS THE CORRECT NUMBER OF COMPRESSIONS (15) ARE REACHED WITHIN THE TIME ALLOWED.

- b. Move Up to head, lean over quickly open the airway again. Take a deep breath, seal the nose, and deliver two quick full breaths.
 - c. Move back to the chest, locate proper hand position and begin 15 compressions at a rate of 80 per minute again.
 - d. Repeat the above cycle four times.
- #### 2. Checking for return of pulse or breathing after first minute.

- a. After delivering the two quick, full breaths of the last cycle, place your ears over the victim's mouth and nose, looking toward the victim's chest and stomach and look, listen and feel to determine if spontaneous breathing has resumed.
- b. Leaving the hand on the forehead to maintain head position, palpate the carotid with the other hand to determine if spontaneous heartbeat has returned.
- c. It is optional whether eye pupils are checked. This is of limited value and not always a sure sign of the victim's condition because of a number of factors.

3. Resume CPR

- a. If breathing and pulse are still absent, resume single rescuer CPR.
- b. If single rescuer CPR is continued, stop and check for return of spontaneous breathing and pulse every 4-5 minutes thereafter.

You know that artificial circulation is not as effective as normal healthy circulation. With each compression you must maintain adequate blood flow; then you must release the pressure and allow the heart to refill after each compression. Any interruption in compression results in a drop in blood flow to zero.

NEVER INTERRUPT CPR FOR MORE THAN FIVE SECONDS.

(Except in Special Circumstances.)

P. Two rescuer CPR

When a second rescuer becomes available he or she ideally takes over ventilation.

In real situations the second rescuer assists as soon as available, When testing students, the second rescuer enters following the check for the return of pulse and spontaneous breathing after one minute of single rescuer CPR. The first rescuer should resume one rescuer CPR.

As a second rescuer arrives, he should identify himself as a trained rescuer and let the first rescuer know that he is willing to help. Without stopping CPR, the single rescuer lets the second know that he Wants him to assist and is ready to switch over to rescuer CPR.

Now the second rescuer will need to check the victim's pulse himself, in order to assure himself that the first rescuer has correctly interpreted the victim's condition. He kneels down on the opposite side of the victim from the first rescuer, in position for rescue breathing, with his fingers in position to feel the victim's carotid pulse. After he can feel a pulse with each compression, he calls out "Stop compression." first rescuer stops

compressing for five seconds, so that the second rescuer can check if the victim has a spontaneous pulse or if breathing has returned. If no pulse or breathing is found, the second rescuer should inform the first rescuer of his findings and the rescuers are ready to begin two rescuer CPR immediately.

The second rescuer should interpose a breath immediately after establishing pulselessness. The first rescuer changes from a rate of 80 to 60 compressions per minute and changes to the slower mnemonic (one-one thousand, two-one thousand, three-one thousand, four-one thousand) .

The rescue breathing is then interposed during the upstroke of each 5th chest compression.

The student should learn:

1. That mouth to mouth positioning should occur at the end of the 4th compression.
2. That the airway should be "pressurized" during the 5th downstroke. This does not mean moving air but it does mean applying gentle pressure so that the breath may be quickly interposed during the upstroke of the fifth compression. It is sometimes helpful to ask the student to think of lifting the compressor's hands with his ventilation during the fifth upstroke. The chest compressor should be counting out loudly and clearly, "one-one thousand, two-one thousand, three-one thousand, four-

one thousand, five-one thousand." There should be no pause or hesitation following the fifth compression prior to the first compression of the next cycle of five. Other mnemonics which accomplish the same purpose are acceptable for certification.

The ventilator should feel for the carotid pulse frequently during chest compression to assess the effectiveness of compression. If the pulse is inadequate, the ventilator should tell the compressor to compress harder. Ventilation and compression should be interrupted to check for the return of the spontaneous breathing and pulse very few minutes. A logical time to do this would be at the time of the switch in position of the rescuers. If they switch more frequently than every two minutes, it is not necessary to check during every switch.

Q. Two rescuer change of position

CPR can be performed smoothly and effectively when the two rescuers are on the opposite side of the victim. They can then switch positions when necessary without serious interruption in the 5:1 sequence. The switch is initiated when the rescuer who is performing compressions states that a switch takes place at the end of a 5:1 sequence. The chest compressor, instead of saying "one-one thousand, two-one thousand, three-one thousand, four-one thousand, five-one thousand," says instead, "change one thousand, two-one thousand, three-one thousand, four-one thousand, five-one thousand."

(Any mnemonic which accomplishes this purpose is acceptable.) The rescuer who is performing the ventilations, after giving a breath, moves into position to give compressions. The rescuer giving compressions, after giving the fifth compression, moves to the victim's head and checks the pulse for 5 seconds but no longer. If no pulse is felt, the rescuer at the head give a breath and tells the rescuer at the chest to "continue CPR"! If there is a pulse but no breathing, he should say there is a pulse and give artificial ventilation.

R. Gastric distention

Artificial ventilation frequently causes distention of the stomach. This occurs most often in children but it is not uncommon in adults. It is most likely to occur when excessive pressures are used for inflation of if the airway is partially completely obstructed. The incidence of gastric distention can be minimized by limiting ventilation volumes to that point at which the chest rises, thereby avoiding exceeding esophageal opening pressures.

Marked distention of the stomach may be dangerous because it promotes regurgitation and reduces lung volume by elevation of the diaphragm. If the stomach becomes distended during rescue breathing, recheck and reposition the airway, observe the rise and fall of the chest, and avoid excessive airway pressure. Continue rescue breathing without attempting to expel the stomach contents. Experience in the field has shown that attempting to relieve stomach distention by manual pressure over the victim's upper abdomen is an

almost sure way to cause him to regurgitate. Where suctioning equipment is not available, aspiration of stomach contents into the lungs may occur. If regurgitation does occur, turn the victim's entire body on the side, wipe out mouth, and continue CPR.

If severe gastric distention results in inadequate ventilation by elevating the diaphragm and it cannot be corrected by repositioning the airway, pressure over the epigastrium (after placing the victim on his side) to expel the air from the stomach may be necessary despite the risk of inducing regurgitation and aspiration.

II. BASIC LIFE SUPPORT IN INFANTS AND CHILDREN

A. Introduction

Death rates have declined significantly during this century, and nowhere is this more true than in children. Today these chances are vastly improved and a child born today has a 98% chance of growing to adulthood. The death of a child, a common place event of yesteryear, has become the exception today. Nevertheless children do die. The transition from the womb to the outside world is a hazardous journey whose success depends on many adaptive mechanisms. It is not surprising then that the perinatal period should also be a time when CPR is probably more commonly used than at any other period of life. Fortunately in this country most births occur in a hospital setting. The CPR is performed by medical or nursing personnel and belongs in the Advanced Life Support. Occasionally, however, an infant is born in an unexpected place and at an

unexpected time. A knowledge of BLS for infants will assure such a baby the best chance of survival. Having passed this dangerous period of life, the chances of sudden death decline and the number of children who might require resuscitation is small. Nevertheless, an examination of the statistics will indicate that the major cause of death in this age group is accidents which by their nature are sudden, requiring immediate action. A knowledge of CPR for the infant and child and how this differs from that in the adult is therefore essential.

The basic principles of CPR are the same whether the victim is an infant, child, or adult. These principles include:

1. Establishing unresponsiveness or respiratory difficulty;
2. Calling for help;
3. Positioning the victim;
4. Airway; (a) Opening the airway; (b) Establishing breathlessness;
5. Breathing for the victim: (a) Resue breathing; (b) Recognizing and managing the obstructed airway.
6. Circulation: (a) Establishing the presence or absence of pulse; (b) Activating the EMS system; (C) External chest compression.

The differences in CPR in the infant and child are in priorities and techniques to allow for different underlying causes of the emergencies in infants and children and for variation in size.

Causes of Cardiopulmonary Arrest in Infants and Children :

Cardiopulmonary arrest from primary cardiac causes and rhythm disturbances is rare in infants and children. In the majority of instances, infants and children will have primary respiratory arrest with cardiac arrest a result of the ensuing hypoxia. Great attention, therefore, must be paid to patency of the airway and adequacy of ventilation. In many instances, further resuscitative attempts will prove unnecessary.

The major events that may necessitate resuscitation are the following: (1) suffocation caused by foreign bodies, e.g., toys, peanuts, plastic covers; (2) near drowning; (3) automobile or other accidents; (4) poisoning and drug overdose; (5) smoke inhalation; (6) sudden infant death syndrome (SIDS); (7) infection of the airway; i.e., croup, epiglottitis.

The vast majority of emergency situations requiring CPR are preventable, and special attention must therefore be paid to producing an environment for the child that is safe and protective without suppressing the child's intellectual curiosity and need for exploration and discovery. Children should be taught respect for matches and fires and, if too young, should not be left unsupervised. Toys should be carefully examined for small parts, which could be potentially aspirated, before being given to toddlers whose mouths are favorite receptacles. Beads, small plastic toys, marbles, and peanuts must be kept away from infants

and preschoolers. Children should be taught to sit while eating and not be allowed to eat while running and playing. When in automobiles, appropriate infant seats and seat belts should be worn; and when old enough children should be taught water safety rules. Even the best performed CPR is worse than the prevention of the cause leading to its need.

Size of the Infant or Child.: Children differ in size from infancy through adolescence. For the purpose of CPR, we have called anyone younger than one year an infant and between one and eight years a child. Techniques appropriate to the adult may be applied to children older than eight years of age. It is recognized that there are large infants (younger than one year of age) who might be mistaken for a child (one to eight years), while at the other end, a small adolescent might be mistaken for a child. These definitions should be taken as guidelines only. At the time of an emergency, one should not try to be too exact about age since a slight error one way or the other is not critical.

B. Establishing Unresponsiveness or Respiratory Difficulty

An unconscious infant or child, like an adult, will not awaken or cry when shaken. The extremities will be limp. Therefore, to determine if an infant Or child is unconscious, he should be gently tapped or shaken. If conscious, he will begin to move and cry.

If a child is not unconscious but is gasping and struggling to breathe, he may need to have his airway opened and, if necessary, have rescue

breathing coordinated to his breathing. As previously noted, the need for rescue breathing alone is more commonly required in infants and children than in adults.

Positioning the Victim: The circumstances in which the child victim is found will determine to some degree the care that must be exercised in positioning him. The likelihood of neck, spine, or bone injuries will be greater if the victim is found at the scene of an accident or at the base of a tree than if an infant is found in bed not breathing. If the infant or child is face down, he must be rolled over as a unit. One hand should always support the head and neck so that it does not roll or twist.

C. The Airway

Opening the airway: Once it has been established that the infant or child is unconscious or is having serious difficulty breathing, the airway should be opened. An infant or child who is struggling to breathe but whose color is not blue probably has an adequate airway and is best immediately transported by the rescuer to an advanced life support facility. The infant or child who is not breathing or is making breathing efforts but is blue should have the airway opened. This is best done by the head tilt neck lift technique or the head tilt augmented by the chin lift.

The head tilt lift technique is performed by placing one hand (or as many fingers as will fit comfortably) under the victim's neck and the other hand on the forehead. The neck is lifted slightly and the head

pushed back with gentle pressure on the forehead. This extension of the head will usually be sufficient to move the tongue away so it does not obstruct the airway. In some situations, the chin lift technique may be helpful in moving the tongue forward and away from the posterior pharyngeal wall. In this technique, extension of the head is maintained by pressure on the forehead.

The tips of the fingers of the hand that had been under the neck are now used to lift the bony part of the jaw near the chin forward. Care should be exercised that the mouth is not closed completely and that the fingers are not causing undue pressure on the soft tissue under the jaw.

Establishing Breathlessness: As soon as the airway is opened and while it is maintained, the rescuer should immediately check whether the victim is breathing. The rescuer places his ear over the victim's mouth and nose and looks toward the victim's chest and abdomen. The victim is breathing if the rescuer (1) sees the chest and abdomen rise and fall, (2) feels air from the mouth and nose, and (3) hears air during exhalation.

It should be stressed that the airway may be obstructed despite respiratory efforts by the victim. Often, opening the airway is all the victim needs in order to breathe effectively. If the Victim resumes breathing, the airway is simply maintained. If the victim is not breathing, rescue breathing is applied. If after made by the rescuer whether to apply rescue breathing. This decision can be made by

looking for blueness of the lips (the lips themselves, not the skin surrounding the lips), which is a sign of oxygen lack. If the lips are pink, enough oxygen is reaching the blood, and rescue breathing should not be attempted; instead, the victim should be transported as rapidly as possible to an advanced life support unit while patency of the airway is maintained. If the lips of an infant or child who is not breathing or who is struggling to breathe are blue, not enough oxygen is reaching the blood and rescue breathing is applied.

D. Breathing

Rescue breathing refers to the ventilation of a non-breathing infant, child or adult by a rescuer. If the Victim is an infant, the rescuer must cover both the mouth and the nose and make a seal. If the child is large enough so that a tight seal cannot be made over both nose and mouth together, the nose is pinched as in the adult, and only the mouth of the child is covered as in ventilation of the adult victim.

When an airtight seal has been established either mouth-to-nose and mouth, or mouth to mouth, four gentle breaths are delivered in rapid succession Without allowing for full lung deflation. These four quick breaths serve as a means of checking for airway obstruction as well as opening the small air sacs in the lungs. The lungs of a child and especially an infant are smaller than those of an adult and have a correspondingly smaller volume. Ventilation should be limited to the amount of air needed to cause the chest to rise. It should not, however, be forgotten that the smaller air passages provide a greater

resistance to air flow, and the rescuer's blowing pressure will probably have to be greater than he imagines. As soon as the chest, which should be carefully watched, is seen to rise and fall, the right amount of force is being used.

In the past great emphasis has been placed on not blowing too hard for fear of causing rupture of the air space. This is indeed an ongoing concern, but emergency room personnel have been impressed with the fact that most infants and children are being underventilated rather than overventilated. The key is to watch for a rise in the chest; if it doesn't occur check for airway patency and blow harder air enters freely with the four breaths and the chest rises, the airway is clear and the rescuer proceeds with checking the pulse. If air does not enter freely, patency of the airway should be checked. If, after readjustments of head extension and chin lift, air still does not enter freely, an obstruction must be suspected.

Gastric Distention: Artificial ventilation can cause stomach distention that, if excessive, can interfere with rescue breathing by elevating the diaphragm and thus decreasing lung volume. The incidence of gastric distention can be minimized by limiting ventilation volumes to the point at which the chest rises, thereby avoiding exceeding the esophageal opening pressure. Attempts at relieving gastric distention by pressure on the abdomen should be avoided because of the danger of aspirating stomach contents into the lungs. Gastric decompression should be attempted only if the

abdomen is so tense that ventilation is ineffective. In such a situation, the infant or child's entire body is turned to the side before pressure is applied to the abdomen.

Airway Obstruction: It should be kept in mind that airway Obstruction with secondary cardiac arrest is much more common in infants and children than cardiac arrest with secondary airway obstruction. Airway obstruction can be caused by a foreign body such as a toy, peanut, or other small objects or may be caused by an infection which causes swelling of the airway such as occurs in croup or epiglottitis. The differentiation between a foreign body and an infectious cause is important, since in the latter cause, going through the following steps for dislodging a foreign body will not be helpful, can be dangerous, and will cause delay in transporting the child to an appropriate advanced life support unit. The signs of croup or epiglottitis are those of airway obstruction, and the underlying cause can only be suspected at the time of an emergency by the circumstances under which the event occurred. A child who has been ill with fever, a barking cough, and progressive airway obstruction needs transportation to the nearest advanced life support facility, whereas a child, previously healthy, who chokes while eating peanuts or playing with small toys and has difficulty in breathing may need CPR and relief of the airway obstruction. With partial airway obstruction, the victim may be capable of either good air exchange or poor air exchange. With good air exchange, the victim can cough

forcefully, although there may be wheezing between the coughs. As long as good air exchange continues, the victim should be allowed and encouraged to persist with spontaneous coughing and breathing efforts. At this point, the rescuer should not interfere with the victim's attempts to expel the foreign body.

Poor air exchange may be present initially, or good air exchange may progress to poor air exchange. Poor air exchange is characterized by an ineffective cough, high pitched noises while inhaling, increased respiratory difficulty, and especially blueness of the lips, nails, and skin. Partial obstruction with poor air exchange should be managed as a complete obstruction. Relief of foreign body airway obstruction is achieved through a combination of back blows and chest thrusts. Abdominal thrusts are not recommended in infants and children because of their potential danger of injury to the abdominal organs, especially the liver.

If the victim is an infant, he is straddled over the rescuer's arm with the head lower than the trunk. The head must be supported with a hand around the jaw and chest. For additional support, it is advisable for the rescuer to rest the forearm on his thigh. Four back blows are rapidly delivered with the heel of the hand between the infant's shoulder blades. Care must be exercised, since much less force needs to be exerted than in the adult. Immediately after delivering the back blows, the rescuer places his free hand on the infant's back so that the victim is sandwiched between the two hands,

one supporting the neck, jaw, and chest, while the other is in a position to support the back. While continuing to provide support to the head and neck, the victim is turned and placed on the thigh with the head lower than the trunk, and four chest thrusts are delivered in rapid succession in the same manner as external chest compressions are performed in the infant. If the victim is a child, too large to straddle the rescuer's forearm, the rescuer kneels on the floor and drapes the victim across the thighs, keeping the head lower than the trunk.

The four back blows can be delivered with somewhat greater force than that used for the infant. With the head and back supported, the child is rolled over onto the floor and is now in position for the four chest thrusts. These are applied in the same manner as external chest compression is applied for the child, using only the heel of one hand. Blind finger sweeps are to be avoided in infants and children since the foreign body can easily be pushed back and cause further obstruction.

In the unconscious victim, immediately after the chest thrusts, the tongue and lower jaw are lifted toward and the mouth opened. This is done by placing the thumb in the victim's mouth over the tongue, the other fingers are wrapped around the lower jaw. If the foreign body is visualized, it may be removed.

If the victim has not started breathing after this maneuver, the airway should again be opened and a seal made over the mouth or

the mouth and nose of the victim and an attempt made to deliver four breaths. If the chest does not rise, the obstruction persists, and its relief must again be sought via the above technique.

1. Recommended Sequence for Relief of Obstruction

a. For the Conscious Choking Infant or Child:

- (1) Identify complete airway obstruction (in the infant look at color of lips to see if they are blue; in the older child check ability to speak) .
- (2) Apply four back blows in rapid succession.
- (3) Apply four manual chest thrusts.
- (4) Repeat b and c until they are effective or the victim becomes unconscious.

b. For the Choking Infant or Child Who Becomes Unconscious:

- (1) Call for help and if a second person is available activate the EMS System.
- (2) Open airway and ventilate if unable to ventilate then
- (3) Apply four back blows in rapid succession.
- (4) Apply four manual chest thrusts.
- (5) Open mouth and if foreign body is visualized remove it with a finger sweep.

- (6) Reposition the head, open the airway and attempt to ventilate. If the infant or child cannot be ventilated then
- (7) Repeat above steps.

E. circulation.

Checking the Pulse: Once the airway has been opened and four breaths delivered, it must be determined whether only breathing has stopped or whether a cardiac arrest has also occurred. Cardiac arrest is recognized by absence of a pulse in the large arteries in an unconscious victim who is not breathing. The pulse in a child can be felt over the carotid artery in a manner similar to that described for the adult.

The feeling of a pulse in an infant is more of a problem.

Unfortunately, the very short and at times fat neck of an infant makes the carotid pulse difficult to feel. Precordial activity represents an impulse rather than a pulse and has been found not to be reliable. Some infants with good cardiac activity may have a quiet precordium, leading to the erroneous impression that chest compression is indicated. Because of this difficulty, it is recommended that in infants the brachial pulse be checked. With practice, this can be as easily mastered as palpating a carotid pulse. The brachial pulse is located on the inside of the upper arm, midway between the elbow and the shoulder. The rescuer's thumb is placed on the outside of the arm, between the shoulder and the elbow. The tips of the index and middle fingers are placed on the opposite side

of the arm. The index and middle fingers are pressed lightly toward the bone until the pulse is felt.

When there is a pulse but no breathing, then only breathing has arrested. Rescue breathing must continue as long as the infant or child cannot breathe for himself. Ventilation should be gentle, just enough to make the chest rise, and if the infant or child is struggling for breath, ventilation should be coordinated with the victim's respiratory effort. As the victim attempts to breathe in, the rescuer should breathe out into the victim's lungs.

Anyone observing an infant or child breathing will note that the smaller the child, the more rapid is the natural breathing rate. Breathing rates for infants and children under conditions of resuscitation should be more rapid than for adults: (a) infant breathe once every 3 seconds or 20 times per minute; (b) Child breathe once every 4 seconds or 15 times per minute.

External Chest Compression: If the victim's pulse is not palpable, then a combination of rescue breathing and chest compression is indicated to circulate blood around the body. Rescue breathing alone is indicated when breathing has stopped, but a pulse is still palpable. Chest compression is never performed without rescue breathing. It is in the technique of external chest compression that differences between infants, children, and adults become most apparent. The differences are related to the position of the heart.

within the chest, the small size of the chest, and the faster heart rate of the infant and child as compared with that of the adult.

Position of the Heart: As the Chest grows, the proportion occupied by the heart diminishes. The heart in the infant and child is situated higher in the chest than it is in the adult. The proper area of compression in the infant is the mid sternum. If an imaginary line is drawn between the nipples, the proper area of compression is the mid portion of this line. A child's heart is lower than an infant's but not as low as an adult's. Using the technique as described for the adult, the notch where the ribs join in the center of the chest is located with the middle finger. The area just above the index finger is the appropriate area of compression in the child. The chest of an infant or child is smaller and more pliable than that of an adult. Two hands are not necessary for proper compression. In an infant, two or three fingers are adequate. With the fingers On the mid-sternum (between the nipples) , the breast bone is compressed 1/2"-1" (1.3-2.5 cm) . The victim should lie on a hard surface to achieve best results. In the child, more force will have to be exerted. If the infant or child is large enough so that the sternum will not easily compress with three fingers, the heel of one hand will be needed. Only the heel of the hand should be used; the fingers must be kept off the chest. If the victim is large enough to require the heel of the hand for compression, the depth should be increased to 1"-1-1/2" (2.5-3.8 cm)

Because of the inherently faster heart rate in infants and children, the compression rate must also be faster as follows (1) infants - 100 compressions per minute; (2) Children - 80 compressions per minute.

External chest compressions must always be accompanied by rescue breathing, and the two must be coordinated. The ratio of compressions to respirations is 5:1, both for single and for two rescuers. In infants and small children, backward tilt of the head lifts the back. A firm support beneath the back is therefore required for external chest compression and can be provided by the rescuer slipping one hand beneath the child's back while using the other hand to compress the chest. A folded blanket or other adjunct can also be used beneath the back to provide support. This helps to maintain head tilt and an open airway. Head tilt can also be maintained by utilizing the hand not performing compressions. When only a single rescuer is present, after each fifth compression a breath is interposed without stopping compressions. A brief pause is acceptable if necessary. Compressions should be counted by the rescuer performing the compression as follows: (1) infant, One, two, three, four, five, (breathe;) ; (2) Child, One and two and three and four and five (and breathe) .

Section 19

LEGAL ASPECTS OF FIRST AID & CPR

19.1 **LEARNING GOAL:** The student will have a basic knowledge of the legal aspects of First Aid and CPR training.

PERFORMANCE OBJECTIVE:

19.1.1 The student will define the four basic forms of negligence and ways to prevent them.

19.1.2 The student will list those laws that exempt the provider of First Aid or CPR care from civil liability.

19.1.3 The student will be able to give examples of acts of omission or commission as it relates to the four areas of negligence.

RESOURCE MATERIAL:

I. DEFINITION:

The four basic types of negligence that may apply to First Aid and CPR training are as follows:

A. Simple negligence:

Simple negligence is when an error has been made by the First Aid or CPR provider, however, the provider's peer group with the same level of training given the same circumstances faced by the initial provider, would have made the same mistake. Usually simple negligence is not grounds for litigation.

B. Gross negligence:

Gross negligence is an error has been made by the CPR or First Aid provider, however, in this instance the provider's peers given the same level of training and the same circumstances faced by the initial provider would not have made the same mistake. Gross negligence can be grounds for suit depending on the severity of the injury or damage that the error causes.

In most instances the law makes specific reference to gross negligence.

C. Willful misconduct:

Willful misconduct is when the First Aid or CPR provider does any type of first aid or CPR procedure, knowing at the time he does this procedure it is incorrect. Willful misconduct is definitely grounds for civil litigation.

D. The deliberate act:

The deliberate act on the part of a First Aid or CPR provider to further cause injury to the victim or destroy their property is the fourth and most severe level of negligence in this area. The deliberate act is definitely grounds for civil and possibly criminal litigation.

II. LAWS THAT HELP THE CPR AND FIRST AID PROVIDER

A. The Good Samaritan Act, which basically states that a person who stops and renders aid at the scene of a situation, who acts in good faith to render such emergency aid and acts within their level of training and to the best of their ability is exempt from civil litigation. Legislation has also been passed covering CPR emergencies in that the rescuer acts in good faith within the level of his training and to the best of his ability, without the presence of gross negligence the victim provider is also exempt from civil liabilities.

III. LEGAL ASPECTS FOR FIRST AID

Activities of emergency first aid squads have advanced considerably in the past few years. Questions of their legal privileges and liabilities are continually being asked by those interested in the welfare of the injured.

The function of emergency first aid squads have been established in our social and economic life by the desire to aid those in distress. There are very few laws that effect first aid emergency squads.

1. A traveler is under no legal obligation to assist an injured or sick stranger whom he meets on the way.
2. But, if he proceeds to render assistance, he must do so with reasonable care and skill so as to prevent the causing of further injury or aggravation of the already existent sickness, taking into account the knowledge and skill which he possesses at the time.

3. That reasonable care means that amount of care which would be exercised by the average prudent man under the same circumstances and in possession of the same information and skill.
4. That person receiving treatment is not obliged to pay for emergency service rendered by physicians and hospitals in the absence of an agreement to do so.
5. That the law throws about those receiving treatment, a mantle of protection and permits compensation when they are injured through another's carelessness.
6. A peace officer must see that a drunk person is not only ordered but escorted from a place of danger to a pedestrian right-of-way or other steps are taken to insure his safety until he is able to take care of himself.
7. It is a police officer's duty to render aid or care (provide it) for injured. If he fails, he is liable for prosecution.
8. An individual may call hospital, physician, or ambulance, private or otherwise, and not be liable for the cost.
9. A private hospital can refuse to give first aid, but a physician or nurse within a hospital and on duty must give first aid treatment if you demand such.
10. The law does not compel you to stop and give first aid, but you must stop if hailed by an officer at the scene of an accident or you may be prosecuted.

11. A person can volunteer first aid, but no one can compel or order another person to render first aid.
12. You are liable if you allow a simple fracture to become compounded through carelessness or willful misconduct, if you have furnished treatment to eye injured person.
13. A first aider must remain in charge of the patient until turned over to properly trained or qualified person, physician, or ambulance crew, or until the person treated is capable of caring for himself.
14. An officer may question a patient, but not if the patient's condition will be made more serious by questioning.
15. Under no condition permit patient to sign papers unless fully conscious.
16. No patient is liable if he enters into any contracts before being fully conscious or having complete use of all his normal facilities unless he willfully places himself in the condition of loss of his normal facilities.
17. You are not liable if you use Standard First Aid treatments which you have been taught and which under the circumstances appear reasonably necessary. Use no self made or self planned treatments.
18. A first aider may never charge for services. Physicians may charge if patient is conscious and willing to be treated.

19. Never force treatment on anyone except in cases of hemorrhage, gas filled room, attempted suicide or poison cases.
20. Give physicians all information and obey his orders. He assumes all responsibilities.
21. Use of narcotics or hypodermic is forbidden. These can be administered only by a registered physician or at his direction.
22. You must summon medical help, or make sure it is summoned unless the injured person is capable of obtaining help himself.
23. No liability in transportation of patient, providing precautions are taken to protect patient from further injury through handling or care, and no negligence can be shown on the part of person furnishing the transportation.
24. violation of the sacredness of confidence of the patient does not apply to the lay person.
25. Do not touch or move the body after death appears, unless death is not certain and respiratory steps must be taken, or it is necessary to move the body to protect it or preserve it. Certify that patient appears to be dead and approximately at what time death occurred.
26. Only a physician or a coroner can sign the death certificate.

27. In the event you are transporting an injured person in your automobile, you are responsible for additional injury if an accident should occur due to your negligence or failure to obey the traffic laws.

28. A police officer may direct a motorist to furnish transportation for an injured person, but this does not relieve the motorist from the obligation of due regard for the safety of the patient.

29. It is unlawful to transport an injured person at a speed which does not show due regard for the traffic on, surface and width of, the highway and in an event at a speed which endangers the safety of persons or property.

30. It is the responsibility of a police officer to not only care for the injured person, but also his personal property at the scene of an accident.

31. A hospital may require satisfactory identification of any person who delivers an injured person to them for treatment.

IV. EMERGENCY C. P. R. IMMUNITY

A person who in good faith renders emergency cardiopulmonary resuscitation at the scene of an emergency would be exempt from civil liability for any damages resulting from an act of omission in rendering the emergency care if the person has completed a

specified resuscitation course and is not guilty of gross negligence or does not render the emergency care with the expectation of receiving compensation. Public or private organizations who sponsor resuscitation programs would be exempted from damages as well.

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APPENDIX A

TESTING QUESTIONS

TESTING MATERIALS

The following is a pool of approximately 150 questions that will be used to develop the testing instrument for this curriculum. Questions are multiple choice and essay in format. At the conclusion of the test questions are the training scenarios. These questions and scenarios have been previewed by a panel of experts in the field of first aid and peace officer training. In addition the questions have been given to approximately 100 - 200 recruit peace officers.

1. Once you have determined that a victim is unresponsive, shout for help and then:
 - a. look for a medical alert tag
 - b. position the victim and tilt the head back to open the airway
 - c. position the victim and start rescue breathing
 - d. start CPR
2. You should do CPR instead of rescue breathing when:
 - a. the victim has no pulse
 - b. the victim has a known history of heart disease
 - c. the victim is clutching his chest
 - d. the victims chest does not rise.
3. You open the airway of an unconscious person, who is not breathing, so you give 2 breaths. The air will not go in. What should you do next?

- a. retilt the head and give 2 breaths
 - b. check the carotid pulse for 5 to 10 seconds
 - c. give 6 to 10 abdominal thrusts
 - d. do a finger sweep
4. How should you place your hands when doing CPR ?
- a. side by side on either side of the naval
 - b. side by side, just above the lower end of the breastbone
 - c. one on top of the other two finger widths above the lower end of the breastbone
 - d. one on top of the other, two finger widths below the lower end of the breastbone
5. Why should you do a primary survey?
- a. to find out if the victim has any past medical problems
 - b. to find out if the victim has any broken bones
 - c. to find out if the scene is safe
 - d. to find immediate life threatening problems
6. A friend suddenly starts to choke while eating dinner, He is conscious but is coughing weakly and is making a high-pitched sound. What should you do?
- a. do not interfere and encourage him to continue coughing
 - b. ask "Are you choking" and give abdominal thrusts

- c. do a finger sweep
- d. slap him on the back until he stops coughing

7. If a victim is not already lying on his back, how should you position him so you can do rescue breathing and CPR?

- a. start by rolling the legs, then the shoulders, then the head
- b. start by rolling the head, then the shoulders then the legs
- c. grasp one arm and pull the body over
- d. roll the body as a single unit and avoid twisting

8. How should you open the airway of an unconscious victim?

- a. the head back and lift the neck
- b. tilt the head back and lift the chin
- c. tilt the head back and push down on the chin
- d. do a finger sweep and then 6-10 abdominal thrusts

9. You are performing rescue breathing. You recheck the pulse and there is none, what should you do next?

- a. start CPR
- b. start abdominal thrusts
- c. increase the rate of rescue breathing
- d. decrease the rate of rescue breathing

10. You find some one lying on the floor not moving. You look around and determine it is safe to help what should you do next?
- a. start a primary survey
 - b. position the victim and give CPR
 - c. phone the EMS
 - d. do a head-to-toe exam
11. Some one is choking on a piece of food but is conscious and coughing forcefully, what should you do?
- a. slap her on the back until she stops coughing
 - b. stay with her and encourage her to continue coughing
 - c. give abdominal thrusts
 - d. do a finger sweep
12. The steps of a CPR cycle are:
- a. a finger sweep and 2 breaths
 - b. 5 chest compressions and 10 breaths
 - c. 15 chest compressions and 2 breaths
 - d. 15 abdominal thrusts and 2 breaths
13. Which of the following statements would give an EMS dispatcher the best idea of what kind of help t send to an emergency scene?
- a. the victims is not breathing but has a pulse

- b. the victims was in a car crash
 - c. the victim is unconscious
 - d. the victim collapsed in the street and was moved to the sidewalk
14. If a co-worker is sweating and nauseated and complaining of chest pain you should:
- a. have someone call the EMS
 - b. have the victim stop working and sit or lie down in a comfortable position
 - c. that chest pain sweating and nausea may indicate a heart attack
 - d. all of the above
15. When should you do rescue breathing instead of CPR?
- a. when someone complains of shortness of breath
 - b. when some one isn't breathing and doesn't have a pulse
 - c. when someone isn't breathing but has a pulse
 - d. when some one collapses after moderate exercise
16. How should you place your hands when doing abdominal thrusts?
- a. to either the left or the right of the naval
 - b. in the middle of the breastbone
 - c. on the middle of the abdomen , just above the navel and just below the lower tip of the breastbone
 - d. on the notch where the ribs meet the breastbone in the center of the chest

17. A victim is not breathing but does have a pulse how often should you do rescue breathing?

- a. one every second
- b. once every 5 seconds
- c. once every 10 seconds
- d. once every 15 seconds

18. How do you find the carotid pulse?

- a. slide your fingers from the palm side of the hand to the thumb side of the wrist
- b. locate the Adams apple with the fingers and press down
- c. locate the Adams's apple and slide your fingers down into the groove of the neck closest to you
- d. press firmly under the bony part of the jaw

19. You are doing rescue breathing on a victim that suddenly starts breathing on her own, what do you do next?

- a. consider starting CPR
- b. check for airway obstruction
- c. continue rescue breathing until the EMS comes
- d. keep the airway open and continue to assess breathing until the EMS comes

20. As you survey the scene of an emergency a question to ask yourself is:

- a. is the victim breathing?

b. does the victim have a pulse?

c. is it safe for me to help?

d. all of the above

21. You find an unconscious person with a complete airway obstruction. You remove a piece of food during a finger sweep. What should you do next?

a. begin CPR

b. retilt the head and give 2 full breaths

c. check for a carotid pulse

d. give 6 to 10 abdominal thrusts

22. In a life-threatening emergency when should you call the EMS?

a. after you interview the victim

b. as soon as you check for unresponsiveness

c. after you do a head-to-toe exam

d. after you check the victim's airway, breathing, and circulation

23. Which of the following victims needs CPR?

a. someone whose heart has stopped beating

b. someone who is having a heart attack

c. someone who is not breathing

d. all of the above

24. Which of the following statements about rescue breathing is TRUE?

- a. after you give 2 full breaths look listen and feel for escaping air
- b. don't waste any time opening the airway--start rescue breathing immediately upon finding an unconscious victim
- c. to do rescue breathing use you hands to make a tighter seal around the persons mouth
- d. give one rescue breath every 20 seconds when doing rescue breathing

25. When doing CPR how fast should you do chest compressions?

- a. as fast as you can
- b. at a rate of 20-4- compressions per minute
- c. at at rate of 60-80 compressions per minute
- b. at a rate of 80-100 compressions per minute

26. When giving CPR which of the following is TRUE?

- a. keep your shoulders over your hands
- b. keep your elbows locked
- c. compress up and down smoothly
- d. all of the above

27. Before approaching a victim , you need to survey the scene to decide

- a. how badly is the victim hurt
- b. if the victim needs rescue breathing
- c. whether or not it is safe for you to help

d. whether you need to check vital signs

28. Which of the following is TRUE?

a. rescue breathing is the best way to find out if a person is unconscious

b. the air you breath out of your lungs does not contains enough oxygen to keep a person alive

c. rescue breathing is a way to breath air into a persons lungs when he is not able to do so himself

d. rescue breathing is a way of keeping alive a person who does not have a pulse.

29. When doing CPR why should you recheck for a pulse?

a. because you should stop CPR if a pulse returns

b. because the number of abdominal thrusts you perform depends on the pulse

c. because you should cut down on the number f chest compressions if the pulse returns

d. because you may have to switch to abdominal thrusts

30. When you are doing rescue breathing how can you tell if he victims airway is open?

a. by looking in the victims mouth

b. by giving abdominal thrusts

c. by seeing the victims chest rise and fall

d. by doing a finger sweep

31. After you have checked the victims airway, breathing and circulation what will you be able to call the EMS dispatcher?
- a. whether the victim is breathing and has a pulse
 - b. whether the victim has a history of medical problems
 - c. the victim's name address and phone number
 - d. whether the victim is able to walk
32. Which of the following statement about chest compressions is TRUE?
- a. you should wait 5 seconds between each compression
 - b. you should lift your hands completely off the chest with each compression
 - c. the upward and downward movements should be smooth
 - d. the downward and upward movements should be jerky
33. As you survey a scene the most important thing you should think about is:
- a. doing a secondary survey of the victim
 - b. checking to see if the victim is conscious
 - c. checking to see if EMS has already been called
 - d. being sure the scene is safe for you to enter
34. You have given 2 full breaths to an unconscious victim, you suspect that there is and airway obstruction. which of the e following should you do next?
- a. retilt the head
 - b. do a finger sweep

c. do 6-10 abdominal thrusts

d. use your finger as a hook

35. You are caring for an unconscious victim who does not seem to be breathing. of the steps listed here, which would you take before beginning rescue breathing?

a. open the airway

b. check for a carotid pulse

c. give two full breaths

d. all of the above

36. When you are doing CPR when should you recheck the victims pulse?

a. after the first 4 CPR cycles

b. after every compression

c. after every CPR cycle

d. after the victim begins to breath again

37. Some one has fallen and injured an ankle, you are not sure if it is broken, what should you do?

a. care for the ankle as if it where a fracture

b. have the person try and walk on it

c. elevate the injury

d. apply a dressing and loosely bandage

38. If and object in a victims eye does not wash out you should:

- a. tell the victim to keep the eye still and wait for EMS
- b. put a bandage over the injured eye and wait for EMS
- c. put a bandage over both eyes and wait for EMS
- d. try to get the object out be using tweezers

39. Which method do you use first to stop bleeding?

- a. direct pressure
- b. pressure points
- c. elevation
- d. pressure bandage

40. The last step of the emergency action principles is:

- a. do a primary survey
- b. do a secondary survey
- c. phone EMS
- d. survey the scene

41. The reason you should place a conscious victim of shock in a lying down position is:

- a. to keep him from falling down
- b. to improve circulation
- c. so you can do a head-to-toe exam
- d. so you can do CPR

42. When you think that a victim has inhaled poisonous gases, the **FIRST** thing you should do is:

- a. monitor the ABC's
- b. decide if reaching the victim would put you in danger
- c. get the victim away from the source of the poisonous gas
- d. place the victim on his side

43. For a head-to-toe exam, it is important that you:

- a. do not press hard on any area that hurts the victim
- b. check the victims body in an orderly way
- c. look for cuts, bruises and other signs of injury
- d. all of the above

44. If you think someone who is unconscious might be in a diabetic emergency, but you can't remember the difference between insulin shock and diabetic coma:

- a. don't worry about it; these conditions are not serious
- b. call the victims doctor and make an appointment for him to be checked
- c. care for the victim in the same way as for someone having a seizure
- d. give something to eat or drink containing sugar

45. You are caring for a victim with a burned hand. Put the hand in cool water if:

- a. there are first degree burns or second degree burns with no open blisters
- b. it looks like a third degree burn

c. there are burns with open blisters

d. the burns are very deep

46. What should you do for a victim of heat exhaustion?

a. allow the victim to move around and observe her for one hour

b. cool down the victim, chilling her

c. get her out of the heat and into a cooler place

d. put more layers of clothing on her as a protection against heat.

47. Which of the following indicates an allergic reaction to an insect bite or sting?

a. feelings of hunger.

b. blood or clear fluids draining from the ear or nose.

c. difficult or noisy breathing.

d. headache.

48. The FIRST step in caring for a chemical burn is to:

a. flush the burn with running water.

b. have the victim lie down and elevate the burned part.

c. cover the burn with a loose, dry dressing or cloth.

d. care for shock.

49. A victim's forearm is bleeding severely. You try using direct pressure, but the wound keeps on bleeding. You should try to lift the forearm above the level of the heart unless the victim has:

- a. a heart condition.
- b. a cut artery in the arm.
- c. a fracture in the arm.
- d. an allergic reaction.

50. Your survey of the scene suggests a victim has suffered an electrical shock. The FIRST thing you should do is:

- a. make sure the power source is turned off.
- b. cover all burns with a moist loose dressing.
- c. ask a bystander to help you move the victim.
- d. place the victim on one side in the shock position for vomiting.

51. Which of these is a sign or symptom of stroke:

- a. dizziness or confusion.
- b. slurred speech.
- c. paralysis, often only on one side of the body.
- d. all of the above.

52. You think a person may have swallowed poison, but she does not yet show any signs or symptoms. When should you call EMS and the Poison Control Center?

- a. when she begins to vomit.
- b. after you give something to drink.
- c. immediately; don't wait for signs or symptoms to develop.

d. after you have given her syrup of ipecac.

53. Which of the these signs and symptom indicate heat stroke, not heat exhaustion?

a. body temperature either normal or below normal.

b. very high body temperature.

c. dilated pupils.

d. pupils of unequal size.

54. If someone starts to have a seizure, you should:

a. try to make the victim sit down and hold him still.

b. try to make the victim lie down and hold him still.

c. protect his tongue by putting something between his teeth.

d. protect him by moving things out of the way.

55. You are alone and have to move a victim who might have a spinal injury. Which of these rescue methods is generally best to use.

a. any rescue can be used for spinal injury.

b. two handed seat carry.

c. foot drag.

d. clothes drag.

56. How should you care for frostbite?

a. warm the affected area quickly by putting it in warm water.

b. snugly bandage the injury.

c. rub the affected area briskly.

d. all of the above.

57. Someone who is having a seizure starts to vomit. What should you do?

a. roll him on one side.

b. do nothing until the seizure is completely over.

c. put him in a semi reclining position, with his head and shoulders supported.

d. put something between his teeth.

58. First aid for a victim who might have internal bleeding includes:

a. caring for shock.

b. phoning EMS.

c. monitoring ABC's.

d. all of the above.

59. Which of the following problems should you look for in a secondary survey?

a. no pulse.

b. no breathing.

c. an airway obstruction.

d. a leg fracture.

60. When should you consider moving a victim?

g. when the victim is in immediate danger.

b. when the victim is injured in a car accident.

- c. when you have finished a primary survey.
- d. all of the above.

61. In general, a splint should be:

- a. loose, so that the victim can still move the injured limb.
- b. snug, but not so tight that it slows circulation.
- c. tied with cravats covering the fracture itself.
- d. none of the above.

62. If someone has been bitten on the leg by a snake, immediately calm the victim and:

- a. have him lie down and elevate the bitten leg.
- b. put the bitten leg below the level of the heart.
- c. have him keep moving around.
- d. wash the bitten area with soap and water.

63. What should you do FIRST if you think someone who is vomiting has swallowed poison?

- a. place her on one side.
- b. encourage her to keep vomiting.
- c. give her milk to drink.
- d. do abdominal thrusts.

64. How should you care for a victim of shock?

- a. keep the victim moving around.
- b. massage the victims legs and arms.
- c. give him fluids to drink.
- d. position the victim and maintain body temperature.

65. What is the FIRST thing you should do to care for an animal bite that is bleeding heavily?

- a. control the bleeding.
- b. splint the wound.
- c. wash the wound well with soap and water.
- d. catch and restrain the animal yourself.

66. When you care for someone who might be having a stroke:

- a. do not give her anything to eat or drink.
- b. put something between her teeth to protect her tongue.
- c. consider doing abdominal thrusts.
- d. encourage her to vomit.

67. What should you do for a victim of hypothermia?

- a. rub snow on his face and hands.
- b. take his wet cloths off and cover him with dry clothes.
- c. give him something to drink with alcohol.
- d. all of the above.

68. which of the following is part of checking vital signs?

- a. interviewing bystanders.
- b. preventing infection.
- c. determining breathing rate.
- d. doing a head to toe exam.

69. You have controlled a victims bleeding and are going to put a pressure bandage on the wound. What should you do with the blood soaked dressings already on the wound?

- a. take them off and put on clean ones before applying the pressure bandage.
- b. it doesn't matter what you do with them.
- c. leave them in place and put additional dressings on top of them before applying the pressure bandage.
- d. throw them away; you don't need dressings for a pressure bandage.

70. You are giving first aid to a victim you found lying on his back. You think he might have a neck injury. How should you position his body to dare for shock?

- a. put him on one side
- b. put him in a semi-reclining position, with his head and shoulders raised.
- c. keep him lying flat on his back
- d. elevate his legs and feet

71. When you care for a third-degree burns or second-degree burns with open blisters you should:

- a. flush the burns with cool water for at least 15 minutes
- b. leave the burned areas open to air
- c. cover them with a loose, dry sterile dressing and bandage
- d. wash them well with soap and water

72. Do NOT attempt to control a nosebleed-

- a. if the nose is bleeding heavily.
- b. if the nose is bleeding lightly
- c. if you suspect a head injury
- d. if you suspect it is due to heavy exercise

73. How should you give first aid to someone who has spilled chemicals into an eye?

- a. wipe the chemicals out of the eye with a clean cloth
- b. flush the affected eye with water from the nose outward
- c. encourage the victim to cry
- d. loosely wrap a bandage around both eyes and wait for EMS

74. If you find that a victim has pain and swelling, unequal pupils, blood draining from the ears, and loss of feeling in the hands and feet, which of these problems should you suspect?

- a. a severe allergic reaction
- b. insulin shock
- c. a convulsive seizure

d. a head, neck or back injury

75. Which of the following is a poison that can be absorbed through the skin?

a. oils from poison ivy

b. fumes from carbon monoxide

c. aspirin

d. snake venom

76. How do you recognize heat stroke?

a. hot, red skin

b. cry high body temperature

c. constricted pupils

d. all of the above

77. The number one preventable cause of death in young children is:

a. drowning.

b. heart attack.

c. injuries suffered in car accidents.

d. communicable diseases.

78. To help prevent injuries and death from fires, each home or day care facility should have:

a. two exits.

b. a smoke detector.

c. a fire extinguisher.

d all of the above.

79. You can help prevent scalding burns by:

a. cooking on the back burners of a stove.

b. turning pot handles inward on the stove.

c. turning down the temperature of the water heater to 120 F.

d. all of the above.

80. The best place to store poisonous substances is:

a. on a high shelf.

b. in a high locked cabinet.

c. in a garage.

d. under a sink.

81. Syrup of Ipecac should be given:

a. only on the advice of a physician or poison control center.

b. only to children over age 3.

c. any time you suspect a child has swallowed a poisonous substance.

d. any time you know a child has swallowed a poisonous substance.

82. The most common cause of cardiac arrest in infants is:

a. heart attack.

b. respiratory arrest.

- c. electric shock.
- d. congenital heart abnormality.

83. It is important to know about the risk factors for heart disease because they:

- a. indicate whether or not you are going to have a heart attack.
- b. identify characteristics that may lead to a heart attack.
- c. scare people into quitting smoking.
- d. can help you recover from a heart attack.

84. All of the following are risk factors of a heart attack except:

- a. cigarette smoking.
- b. high fat, high cholesterol diet.
- c. high blood pressure.
- d. nausea and vomiting.

85. If a choking victim is coughing forcefully,

- a. check the pulse.
- b. give 6-10 abdominal thrusts.
- c. sweep out the mouth.
- d. do not interfere.

86. If after receiving back blows an infants airway is still obstructed:

- a. give four abdominal thrusts.
- b. give four additional back blows.

- c. give four chest thrusts.
- d. turn the infant upside down and shake.

87. To determine if there is an obstructed airway in a conscious child, the rescuer should:

- a. ask the victim, "Are you choking?"
- b. shake the victim.
- c. reposition the victim.
- d. perform 6-10 abdominal thrusts.

88. Before the rescuer attempts to resuscitate a victim by performing CPR, the following condition should exist:

- a. brain damage.
- b. dilated pupils.
- c. absence of breathing.
- d. shallow respirations.

89. The first thing that should be done for a collapsed victim of illness or injury is:

- a. examine the victims mouth for foreign bodies.
- b. determine unresponsiveness.
- c. perform the abdominal thrusts.
- d. open the airway.

90. The presence of breathing in an unconscious victim can be determined by:

- a. checking for pupil dilation.
- b. checking for discoloration of skin.
- c. checking the pulse.
- d. looking, listening and feeling for air exchange.

91. The most common cause of airway obstruction in the unconscious victim is:

- a. food.
- b. tongue.
- c. mucus.
- d. dentures.

92. The principle method used for opening the airway is:

- a. head-tilt with chin-lift.
- b. turning the head to one side.
- c. striking the victim on the back.
- d. wiping out the mouth and throat.

93. If the airway seems obstructed after the initial attempt to ventilate an unconscious patient, the rescuer should:

- a. reposition the head and attempt ventilation again.
- b. begin chest compressions.
- c. go on to check the pulse.
- d. check for foreign body airway obstruction.

94. If breathing does not seem to be present after opening the airway:
- a. begin chest compressions.
 - b. determine pulselessness.
 - c. check pupils.
 - d. give two rescue breaths.
95. When the rescuer is alone with a cardiac arrest victim and there is no possibility that another person will arrive, the rescuer should:
- a. activate the EMS system before opening the victims airway.
 - b. do nothing and wait for help to arrive.
 - c. open the victims airway, then activate the EMS system.
 - d. perform CPR for 1 minute, then activate the EMS system.
96. In infants and children the ratio of compressions to ventilations is:
- a. 15:1.
 - b. 15:5.
 - c. 5:2.
 - d. 5:1.
97. According to guidelines of the American Heart Association, infant CPR is performed on a victim:
- a. 0 - 6 months of age.
 - b. 0 - 9 months of age.

- c. under 1 year of age.
- d. under 2 years of age.

98. When giving rescue breaths to an infant, make a tight seal between your mouth and the infant's:

- a. nose.
- b. mouth.
- c. nose and mouth.
- d. none of the above.

99. The rescuer should check the infant's pulse by feeling the:

- a. carotid pulse in the neck.
- b. brachial pulse in the arm.
- c. radial pulse in the wrist.
- d. femoral pulse in the groin.

100. In performing CPR the chest of the infant should be compressed:

- a. 1/2 to 1 inch.
- b. 1 to 1 1/2 inches.
- c. 1 1/2 to 2 inches.
- d. 2 to 2 1/2 inches.

101. The rate of chest compressions in an infant is at least

- a. 90 times per minute.

- b. 100 times per minute.
- c. 80 times per minute.
- d. 60 times per minute.

102. According to guidelines of the American Heart Association, child CPR is performed on a victim:

- a. under 1 year of age.
- b. 1 to 8 years of age.
- c. 8 to 10 years of age.
- d. 10 to 12 years of age.

103. The rescuer should check the child's pulse by feeling the:

- a. carotid pulse in the neck.
- b. brachial pulse in the arm.
- c. radial pulse in the wrist.
- d. femoral pulse in the groin.

104. Rescue breathing for a child with a pulse should be performed:

- a. 8 times a minute.
- b. 10 times a minute.
- c. 12 times a minute.
- d. 15 times a minute.

105. In performing CPR, the chest of the child should be compressed:

- a. 1/2 to 1 inch.
- b. 1 to 1 1/2 inches.
- c. 1 1/2 to 2 inches.
- d. 2 to 2 1/2 inches.

106. The rate of chest compression in a child is:

- a. 60 per minute.
- b. 60 - 80 per minute.
- c. 80 - 100 per minute.
- d. 100 per minute.

107. People experiencing the early signs and symptoms of a heart attack often:

- a. panic and faint.
- b. deny that they are having a heart attack.
- c. drive themselves to the doctor.
- d. go to sleep to relieve the pain.

108. It is important to know about the risk factors of heart disease because they:

- a. indicate whether or not you are going to have a heart attack.
- b. identify characteristics that may lead to heart attack.
- c. scare people into quitting smoking.
- d. can help you recover from a heart attack.

109. A person experiencing a heart attack may say that it felt like:

- a. "an uncomfortable pressure."
- b. "a tightness around my chest."
- c. "bad indigestion."
- d. any of the above.

110. The most serious danger of heart attack is:

- a. stroke.
- b. brain damage.
- c. severe pain in the chest.
- d. cardiac arrest.

111. Before the rescuer attempts to resuscitate the victim by performing CPR, the following condition should exist:

- a. brain damage.
- b. dilated pupils.
- c. absence of breathing.
- d. shallow respirations.

112. The first thing that should be done for a collapsed victim of illness or accident is:

- a. examine the victim's mouth for foreign bodies.
- b. determine unresponsiveness.
- c. perform the abdominal thrust.

d. open the airway.

113. If breathing does not seem to be present after opening the airway:

a. begin chest compressions.

b. determine pulselessness.

c. check pupils.

d. give two ventilations.

114. If vomiting occurs during the resuscitation effort, the best procedure is to:

a. activate the EMS system.

b. stop CPR and wait for help.,

c. change to mouth-to-nose ventilation.

d. turn victim on side, sweep out mouth, and resume CPR.

115. A rescuer's first effort to assure that the victim's airway is open should be:

a. to attempt to ventilate.

b. to properly position the head.

c. to clear foreign matter from the throat.

d. to shake and shout, "Are you ok?"

116. After ventilations by the rescuer, the victim will exhale by:

a. normal relaxation of the chest.

b. gentle pressure of the rescuer's hand on the upper chest.

c. compressions on the chest.

- d. turning the victim's head to the side.

117. Gastric distention during CPR is caused by:

- a. air entering the victim's stomach.
- b. inadequate exhalation of the unconscious victim.
- c. excessive fluids in the stomach.
- d. too much chest compression force.

118. To determine initially whether an adult victim has a pulse, the rescuer should palpate the pulse at the :

- a. brachial artery in the arm.
- b. femoral artery in the groin.
- c. carotid artery in the neck.
- d. radial artery in the wrist.

119. Complications that may result from external chest compressions even when properly performed include:

- a. punctured lungs.
- b. lacerated liver.
- c. fractured ribs and sternum.
- d. all of the above.

120. To perform chest compressions on an adult, one hand is placed on the top of the other with the heel of the lower hand pressing:

- a. over the lower half of the sternum.
- b. on the upper third of the sternum.
- c. on the middle of the sternum.
- d. on the xiphoid process.

121. It is dangerous to leave an unconscious victim lying on his/her back with a pillow under their head because it may:

- a. be difficult for blood to get to the brain.
- b. be difficult to tell when the victim regains consciousness.
- c. cause the tongue to obstruct the airway.
- d. cause serious neck damage.

122. When performing external chest compression on an adult, the sternum should be depressed:

- a. 1/2 to 1 inch.
- b. 1 to 1 1/2 inches.
- c. 1 1/2 to 2 inches.
- d. 2 to 2 1/2 inches.

123. To determine if there is an obstructed airway in a conscious victim, the rescuer should.

- a. ask the victim, "Are you choking?"
- b. shake the victim.

- c. reposition the victim.
- d. perform 6 - 10 abdominal thrusts.

124. To perform the Heimlich maneuver on an unconscious victim, the rescuer should:

- a. sit on the victim's ankles.
- b. kneel beside the victim's chest.
- c. kneel beside the victim's thighs.
- d. kneel astride the victim's thighs.

125. If a victim is coughing forcefully with a partial airway obstruction:

- a. give 6 - 10 abdominal thrusts.
- b. check the pulse.
- c. sweep out the mouth.
- d. do not interfere.

126. Foreign body obstructions of the airway in the adult usually occurs:

- a. during sleep.
- b. during eating.
- c. during a heart attack.
- d. during exercise.

127. Failure to ventilate the victim's lungs adequately can be caused by :

- a. excessive air in the stomach.

- b. inadequate head-tilt.
- c. lack of an airtight seal.
- d. any of the above.

128. According to the guidelines of the American Heart Association, child CPR is performed on a victim:

- a. under 1 year of age.
- b. 1 to 8 years of age.
- c. 8 to 10 years of age.
- d. 10 - 13 years of age.

129. Rescue breathing for a child with a pulse should be performed:

- a. 8 times a minute.
- b. 10 times a minute.
- c. 12 times a minute.
- d. 15 times a minute.

130. When performing one-rescuer CPR on an adult victim, the rescuer must compress at the rate of:

- a. 50 - 60 times per minute.
- b. 60 - 80 times per minute.
- c. 80 - 100 times per minute.
- d. 100 - 120 times per minute.

131. When one rescuer performs CPR, the ratio of chest compressions to lung inflations for an adult victim is:

- a. 12 compressions to 2 ventilations.
- b. 5 compressions to 1 ventilation.
- c. 7 compressions to 1 ventilation.
- d. 15 compressions to 2 ventilations.

132. For chest compressions to be effective, the rescuer must:

- a. allow the chest on release to return to its normal position.
- b. have compression time equal to release time.
- c. have the hands in the proper location.
- d. all of the above.

133. The single rescuer should check the patient for spontaneous return of pulse:

- a. after 10 minutes of CPR.
- b. after 30 seconds of CPR.
- c. there is no need to check.
- d. after the first minute of CPR.

134. Since successful resuscitation of drowning victims has been reported after prolonged periods of submersion in cold water:

- a. perform the abdominal thrust on the victim.

b. initiate CPR even if the victim has been submerged for a prolonged period of time.

c. delay CPR because of the effect of hypothermia.

d. use the back pressure-are lift method of resuscitation.

135. All of the following are risk factors of heart attack except:

a. cigarette smoking.

b. high-fat, high-cholesterol diet.

c. high blood pressure.

d. nausea and vomiting.

136. During two-rescuer CPR, care should be taken to "avoid":

a. compressing the sternum 1 1/2 to 2 inches.

b. giving one breath after every five compressions.

c. performing compressions at a rate of 80 - 100 per minute.

d. stopping CPR for greater than 10 seconds.

137. The switch occurs in two-rescuer CPR

a. whenever the ventilator calls for it.

b. without interruption of compressions.

c. when the patient shows signs of recovery..

d. whenever the compressor calls for it.

138. When a second lay rescuer is available to help with CPR, the new second rescuer:

- a. identifies self.
- b. checks for spontaneous pulse.
- c. continues with one-rescuer CPR if pulse is not present.
- d. all of the above.

139. The rate of compressions in two-rescuer adult CPR is:

- a. one compression per second.
- b. 80 - 100 compressions per minute.
- c. same as infant CPR.
- d. one compression every two seconds.

140. The ratio of compressions to ventilations in two-rescuer CPR is:

- a. 5 compressions to 2 ventilations.
- b. 15 compressions to 1 ventilation.
- c. 5 compressions 1 ventilation.
- d. 15 compressions 2 ventilations.

141. One circumstance under which a nonphysician may discontinue CPR is:

- a. when the rescuer thinks the victims will not survive.
- b. when the rescuer suspects the victim will suffer permanent brain damage.
- c. when the rescuer is exhausted and unable to continue.

d. when the rescuer sees no reaction in the pupils, or other signs of life.

142. A significant increase in successful resuscitation of out- of-hospital cardiac arrest victims is possible if:

a. a doctor is called as well and an ambulance.

b. resuscitation attempts are not started until paramedics arrive with special equipment.

c. CPR is started promptly by a trained bystander.

d. a doctor is present to give orders on how to resuscitate.

143. Basic life support is that phase of emergency cardiac care that includes:

a. early recognition of a cardiac or respiratory emergency.

b. intervention to gain prompt entry into the emergency medical service system.

c. CPR on the cardiac arrest victim.

d. all of the above.

144. Possible cause(s) of sudden death requiring resuscitation include:

a. drug reactions.

b. drowning accidents.

c. heart attacks.

d. any of the above.

ESSAY QUESTIONS

145. If you suspect a fracture to the upper arm, what parts of the arm do you splint.
146. A man who has just been in a auto accident feels pain and tenderness in his neck. You see no signs of an open or closed wound. What procedure do you follow ?
147. How can an officer tell the difference between a sprain and a strain ?
148. You can't tell whether or not a victim's arm is broken what is the best course to follow ?
149. You find a victim of a fall lying on his back with his right leg under his body. You are able to see that the leg has suffered an open fracture. Describe the steps you would follow in treating this victim.
150. A woman who has just fallen down a flight of stairs advises that she can not feel her legs nor can she move her toes. What is the best course of action to follow in treating this victim ?

APPENDIX B

TESTING SCENARIOS

TESTING SCENARIOS FOR THE TRAINING CURRICULUM

SECTION TWO: Shock

The student will be given the following scenario during the testing phase of the curriculum.

As the first to arrive at the scene of a medical aid "man down" call you observe a victim who is obviously suffering from traumatic shock using the role player provided demonstrate the proper steps to take in treating a victim for traumatic shock.

SECTION THREE: Respiratory Emergencies

The student will be given the following scenario during the testing phase of the curriculum:

The student will demonstrate, using a fellow student, the proper sequence the procedure for conducting a primary survey on a conscious and unconscious victim. A demonstrate the appropriate actions depending on the findings of the primary survey.

SECTION FOUR: Obstructed Airway

The student will be given the following scenario during the testing phase of the curriculum:

"You a setting in your favorite coffee shop when a patron at the next table grabs his throat and begins to thrash about. You determine the victim is suffering from an obstructed airway. Using the recommended techniques established by the American Heart Association demonstrate the procedures to follow in dealing with the

following: 1) A partial airway obstruction 2) A complete airway obstruction 3) Obstructed airway of a conscious victim 4) Obstructed airway of an unconscious victim.

SECTION FIVE: Wounds

The student will be given the following scenario during the testing phase of the curriculum.

"You arrive at the scene of a major physical disturbance at a local beer bar. Upon entering the bar you see that no additional fighting is in progress, however, there is at least three victims suffering from wounds. Using the bandage materials provided demonstrate the proper techniques for the control of bleeding in the following wounds: 1) Abrasion 2) Incisions 3) Lacerations 4) Avulsions.

SECTION SEVEN: Specific Injuries

The student will be given the following scenario during the testing phase of the curriculum.

"You are the first police unit to arrive at the scene of an aircraft crash. There is no threat of additional injury to yourself or the possibility of fire or explosion. Demonstrate the first aid procedures for the following injuries: 1) Eye injuries 2) Head injuries 3) Neck injuries 4) Sucking chest wounds 5) Crushing chest injuries 6) Penetrating wounds to the chest and body 7) Back injuries 8) Extremity injuries.

SECTION THIRTEEN: Dressings and Bandages

The student will be given the following scenario during the testing phase of the curriculum.

"You are called to assist the neighboring counties sheriff department in dealing with an explosion at a community college. There is no danger to you or the injured victims. Given the necessary bandage material demonstrate the following bandage techniques: 1) arm splint 2) triangular bandage for the scalp and forearm 3) form a cravat out of a triangular bandage 4) cravat for the forehead, ear, and eye injuries 5) cravat for the knee and elbow 6) cravat for chest and lower extremities 7) how to anchor a spiral bandage 8) open and closed spiral turns for the extremities 9) proper methods of tying off a bandage 10) a figure eight bandage for the hand, wrist, knee, elbow, or ankle.

SECTION FOURTEEN: Bone and Joint Injuries

The student will be given the following scenario during the testing phase of the curriculum:

"You have just arrived at the scene of a traffic collision. There is no threat of additional collision or hazard of explosion or fire. You see a solo occupant in the vehicle who is conscience with no visible injuries. As you begin your triage you discover that the victim has a broken right arm just above the elbow and appears to have a broken leg. Treat the victim for any and all injuries you detect and prepare the victim so that he/she can be removed from the vehicle and transported to the local hospital."

SECTION FIFTEEN: Emergency Rescue

The student will be given the following scenario during the testing phase of the curriculum:

At the scene of a traffic collision it becomes necessary to rescue a victim who has become trapped in a vehicle that has over turned. Demonstrate the proper methods for removal of the victim.

SECTION SIXTEEN: Emergency Childbirth

The student will be given the following scenario during the testing phase of the curriculum:

Using an emergency childbirth model the student will demonstrate the proper technique necessary to deliver a child in a field setting. The officer must articulate the procedures for dealing with a normal birth, breeched birth, pro-lapsed cord emergency, and a still birth.

SECTION SEVENTEEN: Vehicle Extrication

The student will be given the following scenario during the testing phase of the curriculum:

"You are assigned to assist members of the fire departments rescue squad in removing two victims from an over turned vehicle that has gone over a cliff. Demonstrate the proper methods to be used in removing three victims from the vehicle.

SECTION EIGHTEEN: Cardiopulmonary Resuscitation:

The student will be given the following scenario during the testing phase of the curriculum:

"You will demonstrate the approved techniques approved by the American Heart Association in performing C.P.R. under the following circumstances: 1) One man C.P.R. 2) Two man C.P.R. 3) Child variations of C.P.R. 4) Infant C.P.R. 5) Use of adjunctive equipment in C.P.R.